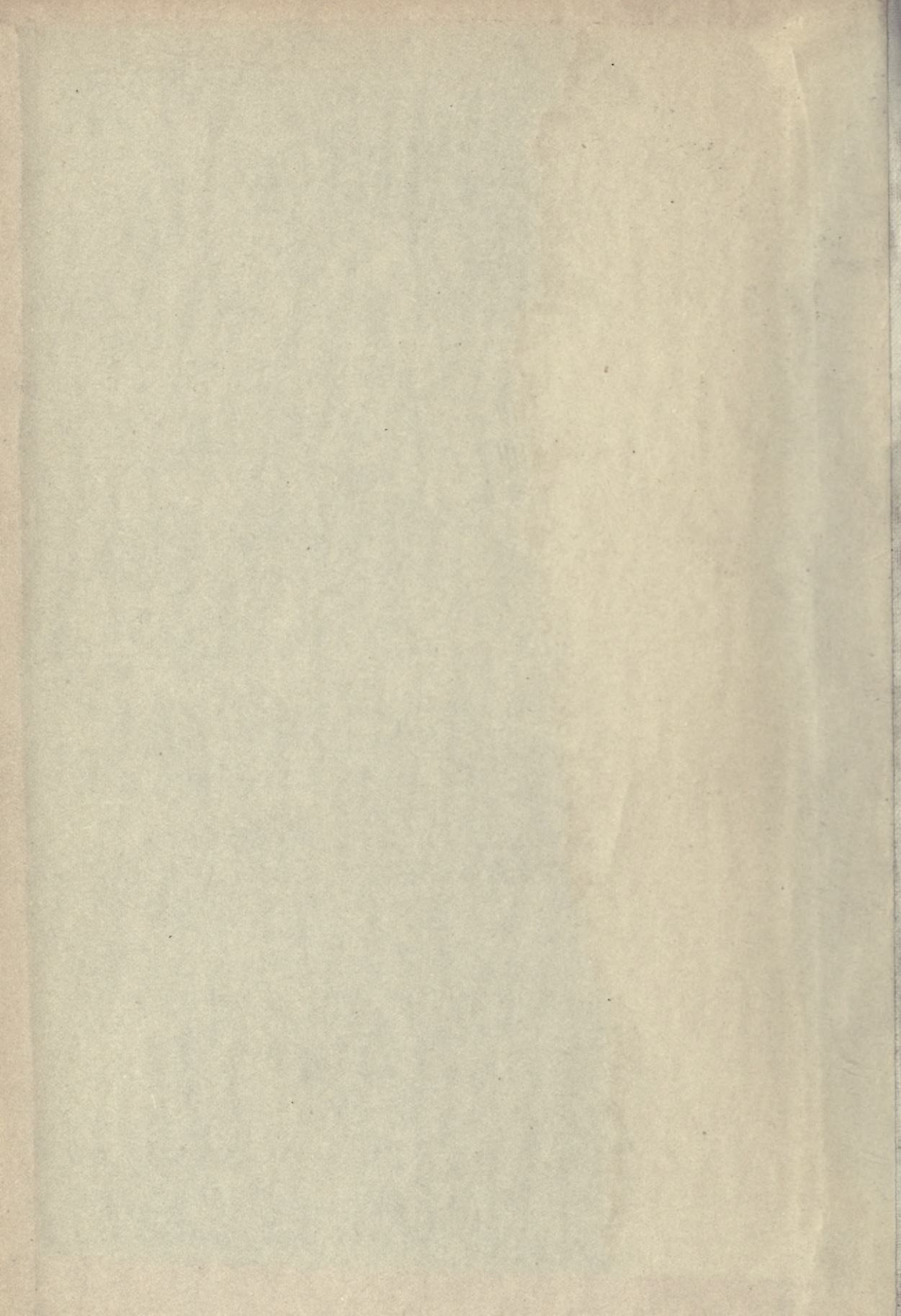


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COLLECTIVE REVIEW

THE ETIOLOGY OF URINARY LITHIASIS

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THE phenomenon of the formation of calculus in the urinary tract has attracted the attention of medical men from the earliest times. In consequence, the hypotheses advanced to explain the cause of and the efforts made to treat and prevent the formation of stone have been legion. Hippocrates was the first to venture an explanation of the disease. He believed that waters containing certain varieties of mud and sand fostered the stone-forming process; he also emphasized the importance of inflammatory changes in the kidneys and bladder as essential factors. Schepelmann believes that the Father of Medicine appreciated the existence and importance of the mucoid binding substance in urinary concretions. Galen asserted that a relationship exists between gout and urinary lithiasis, and with him began the long train of efforts to establish a "crystalline uric acid diathesis" as the forerunner of stone. This concept held sway especially during the latter part of the nineteenth century, and it was during this period that the use of lithium salts as a "uric acid solvent" was much in vogue in the therapy of both gout and stone.

THEORIES OF THE FORMATION OF CALCULUS

In 1856 Meckel expounded the doctrine of a "stone-forming catarrh" in which a low-grade catarrhal inflammation of the kidneys leads to the precipitation of certain elements of the exudate, with certain of the urinary salts, and thus the

stone has its origin. But little was done experimentally until the middle of the last century. In 1857, Rainey produced atypical bizarre crystals of carbonate, oxalate, and phosphate of lime by precipitating these materials from media containing colloidal substances such as gelatin, albumin, gum acacia, and mucus. He suggested a relationship between such atypical crystal deposition and urinary concretions.

Ord and Shattock, in 1895, confirmed and extended the ideas of Rainey. They showed that calcium oxalate usually crystallizes from water solutions as octahedra, but in colloidal media tabloid, dumb-bell, and spheroid forms were obtained. An examination of the nucleus and body layers of calculi of calcium oxalate showed these to be composed of atypical crystals in many respects resembling the forms produced *in vitro*. These crystals were such as might have been deposited in a colloidal medium and seemed to be fused together by an organic matrix. Fowler, in 1906, studied a series of calcium-oxalate calculi and came to similar conclusions.

Ebstein, in 1884, carefully analyzed calculi and proved the existence therein of an organic matrix. With Nicolaier, in 1891, he reported an extensive series of feeding experiments using, among other drugs, different derivatives of oxalic acid. They were surprised to find that one of the derivatives, the diamid of oxalic acid, commonly known as oxamid, on being fed to animals of different species, was excreted in the urinary

stream and in many instances formed concretions varying in size from yellow particles of sand to hard masses 1 cm. in diameter. Chemical analysis showed the stones to consist of oxamid plus an organic substance which Ebstein believed to be albumin. He held that the desquamative catarrh and epithelial debris caused by the toxic action of the oxamid on the renal epithelium furnished the colloidal material by means of which the stone-forming crystals were precipitated.

Tuffier, in 1893, and Rosenbach, in 1911, repeated the work of Ebstein with positive results. Rosenbach found that partial or complete sectioning of the nerve or blood supply of one kidney or ligating one ureter, was followed by a relative deficiency of excretion on that side, with an excess of excretion of the stone-forming material on the other.

Schaepe, in 1909, advanced the idea that stones are formed by the clotting of fibrinogen in the urine with the simultaneous precipitation of urinary crystalloids. Fibrinogen, according to Schaepe, is an "irreversible colloid" or one which, having passed to the state of clot or gel, cannot spontaneously return to the suspensoid phase, that is, the state of colloidal solution. Schaepe was able to produce stony masses *in vitro* by mixing fibrinogen with freshly precipitated lime salts and by then clotting the mixture with calcium chloride. The weakest point in Schaepe's claim lies in the fact that fibrinogen in demonstrable quantity is not usually associated with stone-forming urine, while the rare instances of excessive fibrinogenuria, such as have been reported by O'Connor, have not been associated with stone. However, there are rare cases of fibrin calculi, such as those reported by Gage and Beal, which might have such origin.

Among other evidences of a chemical cause of stone are cited the occurrence of xanthin calculi in xanthinuria, of cystin calculi in cystinuria, the relatively infrequent occurrence of uric acid gravel in acute gout, of oxalate calculi in oxaluria, and of phosphatic calculi in phosphaturia. There is, so far as we know, no evidence of increased excretion of uric acid, oxalate, or phosphate in the greater number of patients with stone. The relation of uric acid lithiasis to gout is much disputed and was denied by Virchow. Bouchard reported eighty-seven instances of uratic calculi in 1,000 gouty patients, while Brugsch noted that six of thirty patients with gout passed uric acid gravel. Moore, in eighty necropsies on gouty patients did not find evidence of lithiasis. However, it is the usual textbook statement that gout predisposes to stone.

If stone is due to a local mechanism at work in the kidney, then an increased elimination of uric acid or of oxalate or phosphate would probably enhance the chances of lithiasis by furnishing a more abundant supply of the material of which the stone is composed.

Much has been written concerning diet as the cause of stone, but the evidence is inconclusive. High purin, oxalate, and phosphate diets have been condemned as predisposing causes. Roberts attempted to explain the high incidence of calculus in India as being due to excessive elimination of uric acid. This, he contended, was the result of a high vegetable diet, with high potassium and low sodium-chloride intake. Possibly the majority of writers continue to assail a high calcium intake as the cause of stone, in spite of the fact that our available pharmacological and clinical evidence is against such an etiologic factor.

Calcification in necrobiotic tissues, metabolic errors, deficiency in oxidation, neuroses, sedentary habits, and the like have also been considered causal factors (124). Young (127), in Osler's System of Medicine, says that concentration of crystals in the collecting tubules, with subsequent erosion of the minute mass through a renal papilla, serves to initiate the stone-forming process. Kleinschmidt believes that small, soft stones are due to sudden precipitation and compression of crystals while larger calculi result from deposition of crystalline material on small stones.

Kuester and Rovsing have suggested that from uric acid infarcts in infants, crystals may form and, being retained, may lead to calculus deposition in later life. Israel and Maas have pointed out that renal trauma is not infrequently followed by calculus, while Seefisch and Mueller have written extensively on the frequent incidence of calculus following spinal cord lesions.

The so-called anatomical or mechanical theories of stone formation are based on the relative frequency with which stones have been found associated with urinary stasis, diverticula, stricture, prostatic hypertrophy, and other forms of obstruction. It has also been asserted that foreign material, renal or extra-renal in origin, is the cause of stone, as a result of reduplication of surfaces and the increased opportunity for surface tension phenomena to come into play. The significance of such association, which has been clinically established by the work of Rovsing, Schenck, Hunner, Braasch and Moore, Crenshaw, and others, will be considered in an experimental study soon to be published.

The bacterial or infectious hypotheses of the formation of stone are in part based on the demon-

stration of bacteria in stones and on the fact that the kidney associated with stone is almost always infected. The clinical relationship between carbonate and phosphate calculi and urinary infection has been emphasized particularly, but it must be borne in mind that the infection has supposedly brought about the deposition of stone by changing the reaction of the urine, and not necessarily by other means. For this reason the urate and oxalate stones have been considered usually as non-bacterial in origin.

Within the past few years Rosenow has developed the doctrine of elective localization and specific activity of bacteria. He has been able to produce cholecystitis and cholelithiasis experimentally by the intravenous injection of bacteria obtained from the gall-bladders of patients with gall-stones. He has suggested that specific infection may likewise be related to urinary lithiasis. Charles H. Mayo has suggested that urinary calculi are formed by the secondary invasion of a previously established low-grade pyelonephritis by specific stone-forming bacteria.

Recently Meisser and Braasch have produced alkalin phosphatic cystitis and urinary concretions by applying Rosenow's specific bacteriological methods. This is an important step forward and is probably the best existing evidence that specific bacteria are related to the process of stone formation.

THE PHYSICO-CHEMICAL FEATURES OF URINARY CONCREMENTS

Albarran divided calculi into those unaccompanied by infection, "primary calculi," and those which appeared clinically to be due to infection, "secondary calculi." The primary calculi included uric acid, ammonium and sodium urate, calcium oxalate which formed in highly acid urines, and also calcium phosphate (crystalline) and calcium carbonate (crystalline) which formed in alkalin urine whose reaction was not due to infection, or in urine faintly acid or neutral. The rare calculi of cystin, xanthin, indigo, urostealith, and fibrin were also considered primary. Secondary calculi were found in alkalin urine whose alkalinity was due to the conversion of urea into ammonium carbonate by so-called urea-splitting organisms. These included, therefore, ammonium magnesium phosphate and the calcium phosphates and carbonates of the amorphous varieties.

VARIOUS CHEMICAL TYPES OF CALCULI

Clinically, there is no uniformity of opinion as to the relative occurrence of the different chemical

types of calculi. The work of Morris, Thompson, Kahn, and Rosenbloom, and others is conflicting. A careful review of the many articles listed in the bibliography leads us to believe that the variation of opinions is due as much to the fact that no one observer analyzes a sufficient number of stones from which conclusions may be drawn as to the discrepancies in technique.

Calcium oxalate, uric acid and urates, phosphates, and carbonates, in the order named, appear to be the most frequent constituents, the vesical calculi of India and China seem to be mostly of the urate and oxalate variety. It is said that uric acid predominates in Europe and oxalate in North America (18). Kahn and Rosenbloom believe that calcium oxalate composes the bulk of most stones and that uric acid is present for the most part in traces, seldom in amounts over 10 per cent. A few of their stones contained slight amounts of phosphorus.

Most authors consider the nucleus of the stone to consist of ammonium urate in infants, of uric acid in young adults, and of calcium oxalate in older persons. Renal stones from patients of all ages are likely to contain more oxalate, while vesical calculi are chiefly composed of uric acid and phosphate. Carbonatic stones, while common in the lower animals, are rare in man although minute amounts of carbonate are often found.

Many stones are layered, the layers consisting not infrequently of different chemical constituents, either pure or mixed. A phosphate-carbonate layer may alternate with an oxalate-urate layer. This feature has been explained as due to a change in the reaction of the urine during the time of the formation of the stone, the phosphate-carbonate layer precipitating while the urine is alkalin, and the oxalate-urate layer precipitating while it is acid. Layers of oxalate may alternate with layers of urate and here again differences of hydrogen-ion concentration or of colloidal relationship have been used to explain the cause.

FACTORS DETERMINING THE SHAPES ASSUMED BY CALCULI

The shapes assumed by calculi is believed to be determined largely by the site of the development of the stone. Thus, small calculi, lying in the minor calices, usually have the contour of the calyx, and larger "stag-horn" stones may uniformly follow the pelvic outline. However, "jackstone and mulberry" varieties of the oxalate stones are difficult to explain on such a basis. Their shapes may possibly be due to internal molecular forces which came into play during their deposition and growth.

THE MICROSCOPIC STRUCTURE OF CALCULI

The structure of calculi can be mentioned only in passing. The works of Ord and Shattock, and Fowler (29) should be consulted for detail. All stones seem to be composed of crystals microscopically atypical in size and shape from the usual crystals of similar chemical composition found in voided urine. These crystals are fused together with a matrix of organic material, often pigmented in clefts and interstices. Most stones show a tendency to lamination and radial striation. Certain earthy phosphates, precipitate from faintly acid or neutral urine and consist of large crystals macroscopically distinct and only partly fused. These show no lamination. In pure phosphatic calculi, firm amorphous material is fused and the lamination is also absent. Young holds that the nucleus of urate and oxalate calculi is not laminated, but the outer layers become concentrically striated as they are deposited. Cystin calculi are not laminated although they may attain large size. Typical or slightly atypical hexagonal crystals are fused in a waxy mass.

SIGNIFICANT CLINICAL FEATURES ASSOCIATED WITH CALCULI

Stones occur more often in males than in females, the ratio being two to one in the Mayo Clinic series (12). They recur in less than 10 per cent of cases after their removal at operation where fluoroscopy and later reraying fail to reveal fragments which have been overlooked. Following the removal of a stone-forming kidney the development of stone in the remaining kidney is extremely rare, while recurrence in damaged kidneys, formerly the site of large branched stones, is not uncommon. Renal and ureteral stones are probably bilateral in approximately 15 per cent of cases, and renal stones are multiple in about 33 per cent. The right and left sides are about equally involved. These clinical features are strongly suggestive of a local stone-forming process at work in the kidney, the ureters, or the bladder.

CONDITIONS UNDER WHICH URIC ACID, URATES, OXALATES, AND PHOSPHATES ARE DEPOSITED FROM URINE

The most common constituents of calculi are oxalates, urates, and phosphates. Uric acid, calcium oxalate, calcium phosphate, and ammonium magnesium phosphate are practically insoluble in neutral distilled water. They are the most insoluble constituents of the urine, where they are present in smaller quantities than other important crystalloids. Normally about 0.7 gm. of

uric acid, 0.015 gm. of oxalic acid, 2.5 gm. of phosphoric acid, and 0.25 gm. of calcium are eliminated every twenty-four hours. These insoluble substances are held in solution in urine to a far greater degree than in water. This property of urine to hold uric acid and calcium oxalate and phosphate in solution has been attributed by most physical chemists, including Schaede, Bechhold, and Lichtwitz, to the presence of so-called protective colloids (Schutzzkolloide). For example, Lichtwitz has shown that the extraction of colloidal material from the urine by means of benzol will result in the immediate precipitation of phosphates. On dialyzing the urine against water the urinary crystalloids were found by Lichtwitz to pass into the water and to be precipitated. The precipitate consisted chiefly of calcium oxalate.

URIC ACID AND URATES

Uric acid is deposited in acid urine in several forms. It is believed to be present in solution as the monosodium salt. Monosodium phosphate, however, tends to take the sodium from sodium urate and is thereby converted to disodium phosphate. The uric acid thus formed is comparatively insoluble. Hence, a high percentage of acid phosphates will tend to lower the solubility of uric acid, while the neutral phosphates will tend to increase its solubility. Sodium chloride, urea, and the urinary colloids seem to increase the solubility of uric acid. Blatherwick has shown that uric acid is not deposited in urine if the alkalinity is greater than P_{h7} whereas the acid urines deposit it in increasing amount as the acidity goes above P_{h7} .

OXALIC ACID AND OXALATES

According to most authors, oxalic acid owes its presence in the urine to incomplete oxidation of uric acid or of carbohydrate. Others believe it is formed in the stomach by carbohydrate fermentation. In excessive oxaluria it is assumed that this deficiency of oxidation or fermentation assumes a pathologic degree, although some authors attribute the condition to lowered urinary acidity, claiming that the excretion of oxalate is not actually increased. A dietary or exogenous source of oxalic acid in the urine depends on the ingestion of certain foods, such as rhubarb and spinach. It is extremely doubtful if such a diet can have more than a remote influence on calculus production. The precipitation of calcium oxalate takes place best in faintly acid urine. It is also deposited readily in alkaline urine, but is supposed to be held in solution in urine of high acidity. Magnesium salts and acid sodium phosphate tend

to increase its solubility. In any crystalline oxaluria the limits of solubility of the calcium oxalate have been reached and discrete unfused octahedra separate and are passed in large numbers. Calculi are seldom found under such conditions.

PHOSPHATES

The phosphates in urine are largely from exogenous or dietary sources. Only 1 to 4 per cent come from the disintegration of body tissues. Calcium and magnesium phosphates may be deposited in faintly acid or alkaline urine, while triple ammonium magnesium phosphate is deposited usually in infected alkaline urine. The experiments of Lichtwitz seem to show that colloidal material is necessary in order to carry them completely in solution. The urinary reaction, however, is equally important, and again many authors attribute the phosphaturia seen in debilitated persons to lowered urinary acidity rather than excessive secretion of phosphates. We have found no statistical evidence of an unusually high incidence of phosphatic calculi in phosphaturia.

CALCIUM AND MAGNESIUM

The calcium and magnesium metabolism is of interest in relation to the "water theories" of stone. The daily urinary output of calcium is about 0.1 to 0.4 gm. expressed as calcium oxide. By far the greater part of the calcium in health is excreted from the bowel. Intravenous injections and feeding of calcium salts do not materially increase the calcium content of the urine (20, 22, 125), as most of the element is excreted through the intestine. In states of low calcium content of the blood and tissues an excess absorption may take place from the intestine, but with a normal calcium balance in the body an increased ingestion of calcium will not lead to a marked increase either in the blood or in the urine. An increased ingestion of magnesium salts leads to an increase of calcium in the urine; the converse is also said to hold true.

Magnesium is eliminated to the extent of 0.1 gm. to 0.3 gm. each day, expressed as magnesium oxide. Its amount depends on the diet. Fifty per cent of magnesium ingested passes through the kidneys, the remainder through the intestines. So far as we know, disturbances of magnesium metabolism are unrecognized in pathology.

CYSTINURIA AND CYSTINE CALCULI

Cystinuria is an error of metabolism which is inborn and hereditary (34, 43, 125). Males seem to be affected by the disease twice as often as

females. Cystin is the amino acid which contains the sulphur of the protein molecule. It is ordinarily destroyed in two ways: by conversion to taurin and then to taurocholic acid, which is excreted in the bile, and by oxidation to sulphates, which are excreted in the urine. In cystinuria this mechanism seems to be interfered with, probably more in the oxidation to sulphate than in the conversion to taurin. In consequence, large quantities of cystin find their way to the urinary stream, when they are carried in solution if the urine is alkaline; an acid urine, however, precipitates the cystin as colorless hexagonal plates. Cystinuria is often associated with cystin stones; in most instances the calculi first attract attention to the condition. It is difficult to know how often cystinuria is unaccompanied by calculi. As cystin crystals are precipitated only in acid urine, many cases of alkaline cystinuria may be missed even if the urine is examined microscopically. The familiar occurrence of cystinuria may be one of the explanations of the relatively few cases of calculus in family groups (98, 78, 9). Cystin calculi may be pure in chemical composition or mixed with other ingredients, such as uric acid and oxalates. The feeding of ammonium carbonate to alkalinize the urine has been strongly recommended in cases of cystinuria as alkaline urine dissolves cystin and thus prevents the formation of stones.

XANTHINURIA AND XANTHIN CALCULI

Xanthin is a normal urinary constituent. It is the most abundant purin base present. It is always soluble in normal persons, the appearance of xanthin crystals in the urine being considered an evidence of a pathologic condition. However, the nature of this crystalline xanthinuria is a matter of total ignorance. The condition is very rare. Xanthin is often mixed with uric acid calculi and is rarely found as the chief constituent of stones. Rosenbloom collected six such cases from the literature and reported a seventh of his own.

RARE TYPES OF CALCULI

Two cases of indigo calculi are on record. It is presumed that the indigo was derived from indican by oxidation.

Fatty stones (urostealiths) have been occasionally described. Their source and chemical composition are veiled in obscurity and we have found little literature on the subject. Horbaczewski analyzed one such specimen and found protein, fatty acids, and neutral fats to be the chief constituents.

Cholesterol calculi have been found in rare instances (125), but the cause is utterly unknown. Horbaczewski found one such calculus in a patient who had had cystin calculi.

Fibrin calculi occur infrequently. They appear to consist of alternating layers of fibrin and calcium phosphate and are associated with repeated attacks of hæmaturia, the nature and cause of which are obscure. The review of the subject by Gage and Beal is interesting. Possibly it is in such cases that Schaede's hypothesis of the formation of the calculi may find an application.

THE GEOGRAPHIC DISTRIBUTION OF URINARY CALCULI

No investigation of urinary calculi is complete without consideration of their geographic distribution. An analysis of the literature shows that the conceptions of the present day are based largely on the work of Hirsch and several more recent contributions from Chinese and Indian sources. The data are drawn chiefly from hospital statistics, mortality records, and the experience of individual practitioners. Naturally, data from well-organized hospitals with properly tabulated case records and necropsy protocols are most valuable. Mortality statistics are based chiefly on death-certificate reports and are likely to vary with the training of physicians and the consequent liability to errors in diagnosis. The fact that in the majority of patients calculi are not the primary cause of death also renders such data unreliable. However, on a large scale, mortality records may be of value. The experience of individual physicians contains so much of the personal factor that this seems the least reliable source of all.

According to most observers, the formation of calculus is uniformly high in Holland, Syria, Lower Egypt, Persia, Italy, Morocco, and Algiers. The rarity of the condition in Iceland, Norway, Sweden, Denmark, Finland, Northern Russia, Germany (except endemic), Ireland, East Indies, West Indies, East Africa, Central Africa, West Africa, Nubia, Tunis, Polynesia, Australia, British Guiana, Uruguay, Peru, and Nicaragua has been emphasized by practically all writers on the subject, most of whom quote Hirsch's observations.

Urinary lithiasis seems to be endemic in certain localities, often circumscribed within narrow geographic limits. Among such localities are the Canton province of China (extremely high), the Punjab and interior upland districts of India, Arabia, Germany (Altenburg has a high incidence within a radius of sixty miles; old Bavaria,

and certain Alpine districts), England (Norfolk, Bristol, and other isolated areas), Scotland, Italy (especially in Brescia and Cremona), Mexico (Oaxaca), France, and Central Russia (a very high incidence in the region around Moscow).

The relationship of the soil and water to the incidence of stone has been studied only superficially. Areas in which stone is of frequent occurrence and limestone is plentiful are the basins of the Don and Volga, the eastern counties of England, Wuertemberg, Italy (Brescia and Cremona districts), Syria, Bosnia, and Herzegovina. Stone abounds in countries in which limestone is not an abundant constituent of the soil, e. g., Canton Province of China, the Island of Mauritius, Indian districts, the Duchy of Altenburg, and Lorraine. Certain limestone areas in which the inhabitants are notably free from stone are the West Indies, the Barbados, Western Switzerland, many parts of England and America, and the limestone districts of India. In this connection it may be noted that in the Alpine districts in which limestone and calculus are coincident most of the natives drink rain water from cisterns.

Frederick L. Hoffman, of the Prudential Insurance Company, has carried out an extensive investigation¹ of the geographic data for the United States. A careful study of his tables reveals an increase in the recorded death rate from urinary calculus within the last two decades. There is a certain definite variation among the states, a tendency to parallelism, in many instances, between deaths from biliary and urinary calculus, and an increase in the mortality with the advance of age.

On the whole, a study of the literature leaves us dubious with regard to the geographic element in the cause of stones. The tendency to formation of calculus in limestone regions, in cold, warm, dry, damp, tropical, or temperate countries is not clear. It seems that the extremely cold regions of the far North are peculiarly exempt and that certain districts, particularly China and India, are more liable to this condition than others.

RACE

Racial differences seem to play little part. The Jews of Northern Germany, Christians in the Balkan States, and Italians in America are accredited with a high incidence. The negroes have long been considered exempt, but Hoffman's tables throw new light on this statement. They show

¹ Dr. Hoffman's work is soon to appear in the *International Journal of Public Health*, Geneva, Switzerland.

that the mortality from urinary lithiasis, in this country at least, is about equal in the two races.

HEREDITY

The familial incidence of cystin calculi has been mentioned. Some authors ascribe uric acid calculi to a familial tendency but it is to be feared that their conclusions are drawn more from the hereditary nature of gout than of stone.

AGE

The greatest discrepancies of opinion occur with regard to age. Various writers consider children almost exempt, while others hold that the incidence in this group is extremely high. The age of greatest occurrence, as judged by time of operation, is in the second, third, and fourth decades. Below ten years and above fifty years the incidence is much less. However, the condition may occur at any age. Thompson, reporting 3,492 operations for calculus (almost all vesical) in the Canton Hospital found 43 per cent in males under 20 years, 41 per cent in those from 20 to 50, and 14 per cent in those over 50. Only 2 per cent of his patients were females.

SUMMARY OF CONCLUSIONS FROM AN ANALYSIS OF THE LITERATURE ON THE ETIOLOGY OF LITHIASIS

1. The problem of the formation of calculus is one of chemical precipitation. We must endeavor to discover what mechanism causes urates, oxalates, phosphates, and so forth to be precipitated in a manner to cause fused, hard concretions rather than individual crystals to maintain their state of isolation in their passage through the urinary tract. Whatever mechanism is at fault, we are certain that the veracity of this statement will remain unaffected.

2. Differences of reaction as determined by the hydrogen-ion concentration and qualitative and quantitative changes in the colloidal materials of the urine, such as pigments, mucin, nebulula, albumin, and nucleo-albumin have been shown to influence the nature of urinary sediments both chemically and physically. The microscopic and gross features of calculi seem to show that an abnormal variation of these factors is at work in the formation of stone.

3. Geographic distribution, race, heredity, age, diet, sex, and trauma seem to offer little suggestion with regard to the cause of concretions. If factors at all, they are probably of secondary importance.

4. The three commonest diseases associated with a visible increase in the crystalline content

of the urine, that is gout, oxaluria, and phosphaturia, are found far more frequently without calculus deposition than with it. Many authors have assumed that there is a high incidence of lithiasis in such diseases, but have offered little or no statistical evidence in support of their views.

Xanthinuria and cystinuria are undoubtedly necessary to the formation of xanthin and cystin stones, but how often patients with xanthinuria and cystinuria escape calculus formation is problematic.

5. On the whole, the clinical evidence of the cause of stone points to a local mechanism at work in the pelvis of the kidney or in the bladder. The frequent occurrence of demonstrable foci of infection in patients with calculi, and the almost universal finding of infected kidneys and bladders associated with stone lend tremendous weight to the idea of a specific stone-forming infection. It is conceivable that at times excessive excretion of crystalloid material may reach such a degree that the normal "protective" colloids of the urine cannot handle the extra burden. Under such conditions calculi may form. Likewise, it is possible that qualitative or quantitative changes in the urinary colloids may occur without bacterial infection. Such changes may lead to the formation of concrement, even though the urinary crystalloid excretion remains within normal limits.

6. There is little direct evidence that anatomical factors or stasis can initiate the stone-forming process, but their frequent association with calculus makes it seem likely that the stone-forming mechanism may work to better advantage under such conditions.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Imbert, L.: Remarks upon Autoplasty (Notes d'autoplastie). *J. de chir.*, 1921, xviii, 113.

The fundamental difficulty in all plastic skin operations is the maintenance of the nutrition of the flap. Success in overcoming this difficulty depends upon many anatomical and mechanical factors in addition to general conditions which influence the vitality of the transplant.

Two vascular plexuses run parallel to the surface of the skin. The deep plexus, which is derived from the subcutaneous tissue, is connected with the superficial plexus by a number of very fine vessels. The area of skin between is rather poorly nourished. The transplant must therefore include the entire thickness of the skin. The ideal technique consists in dissecting the flap in the direction of the arteries but this is often impractical.

In general, the principal nutrition of the flap must be obtained from its pedicle although at times it may be sufficiently nourished by anastomoses from the surrounding tissues. Consequently it is rational to direct the pedicle in accordance with the general circulation of the particular part of the body under consideration. The width of the pedicle must depend upon the abundance of vessels which course within it. The narrow, highly vascular pedicle is very well exemplified in the frontal transplant which may be obtained for a rhinoplasty. In the majority of cases, however, the surgeon must depend upon vascular anastomoses from the surrounding tissues. The surgical problem therefore is how large a flap may be successfully nourished by a pedicle of a given size but it must be remembered that the ultimate vitality of the flap does not depend solely upon the mechanics of the circulation as thromboses and infections are often disturbing elements.

In considering the vitality of the flap one often neglects to consider the area in which the transplant is to be placed. The tissues must be freshened and disinfected and all scar tissue must be thoroughly removed before the flap is applied. The author has found that the results are more often successful when the angle of torsion of the pedicle is between 45 and 135 degrees.

Imbert does not free the pedicle until at least seventeen days have elapsed. The usual interval is twenty to twenty-one days. The sectioning is done under local anæsthesia. At times it is best to do it gradually at two or three sittings as this makes it possible to judge the vitality of each portion of the flap cut away.

The author's results with homoplasty have been uniformly poor even under the most favorable conditions.

LOYAL E. DAVIS, M.D.

Costantini, H.: The Value of a Combined Incision in the Abdomen and Thorax in the Surgical Exploration of the Left Hypochondrium (Valeur de l'incision combinée de l'abdomen et du thorax dans l'exploration chirurgicale de l'hypochondre gauche). *J. de chir.*, 1921, xviii, 130.

The operative technique described by the author permits wide exposure of the left hypochondrium without the risk of creating a pneumothorax or the necessity of resecting any of the ribs.

The operation is carried out with the patient lying upon the right side with the pelvis and lower limbs acutely flexed upon the trunk. A transverse incision from the midline at a point midway between the xiphoid process and umbilicus is made to the tip of the left tenth costal cartilage. The abdominal cavity is entered and the tips of the first and second fingers of the left hand are introduced. With these fingers, the lateral wall of the diaphragm is held firmly against the ninth and tenth ribs.

A lateral skin incision is then made following the course of the ninth intercostal space down to, and exactly dividing, the intercostal muscles. The cartilage between the anterior extremities of the ninth and tenth ribs is removed. A through-and-through running suture is then introduced through the upper edge of the divided intercostal muscles and the diaphragm and another through the lower edge of the intercostal muscles and the diaphragm. These tightly appose the diaphragm to the chest wall and seal off the pleural cavity hermetically. It is of course extremely important to hold the diaphragm against the chest wall as tightly as possible until this latter step is completed.

The diaphragm is then incised between the lines of suture and the field of operation is exposed. Closure is effected by bringing the diaphragmatic edges together. The line of suture is further strengthened by approximating the ninth and tenth ribs.

This operation is indicated in cases of thoraco-abdominal wounds which have a thoracic wound of entry, for diaphragmatic hernia, tumors in the left hypochondrium, and contusions and wounds in the left hypochondrium which have an abdominal wound of entry. In the first type of case pneumothorax is already present but the incision described allows thorough treatment of the diaphragmatic wound and complete exploration of the abdominal viscera.

LOYAL E. DAVIS, M.D.

Robineau, M.: Suture of the Intestines (Les sutures sur le tube digestif) *Presse méd.*, Par., 1921, xxix, 721.

In the usual intestinal anastomosis a small dead space is left between the sero-serous and the sero-muscular layers of sutures. This fact is well illustrated when the stump of an appendix is ligated and invaginated by a sero-serous row of sutures. In his own cases and those of others the author has observed the formation of a small abscess in this dead space following the escape of intestinal contents through the perforation of a through-and-through suture.

To prevent this complication Robineau has been using a slight modification of the classical method. No sero-serous suture is applied. The surfaces of the bowel are incised to the mucosa and the sero-muscular edges are united. The mucosa is then incised and the posterior edges are sutured. In the next step the anterior edges of the mucosa are brought together and lastly the anterior musculo-serous edges.

This method is particularly efficacious in gastric surgery and for lateral anastomosis of the intestines. The author has never seen the formation of an abscess or fistula following its use.

LOYAL E. DAVIS, M.D.

Culbertson, C.: Use of the Sigmoid Flexure and Cæcum in Pelvic Peritonization. *J. Am. M. Ass.*, 1921, lxxvii, 772.

The problem of disposing of raw areas resulting from peritoneal adhesions is discussed with special reference to the variety representing suppurative processes in the pelvis and lower abdomen. Transplantation of peritoneal or omental grafts is perhaps the best method for a small area of raw surface that must necessarily remain exposed. The ideal operation on the pelvis when raw areas are produced leaves none but smooth peritoneal surfaces throughout.

In the author's opinion it is freedom of the ileum from postoperative involvement that is most desired as it is such involvement that is the cause of most of the distress. Intestinal obstruction due to involvement of the sigmoid flexure is seen more commonly in cases of malignancy than in cases of inflammation.

If the ileum is involved it must be freed and peritonization must be effected by means of omental or peritoneal transplants. The sigmoid flexure, however, is capable of functioning when there is at least relative immobilization, and the best way to keep the ileum out of the pelvis is to block off the true pelvis entirely. This is accomplished by using the sigmoid and rectum alone or with the cæcum on the right side after the appendix has been removed. Infiltrated and raw areas present on these structures are rolled under by the same procedure.

Instead of trusting to the sigmoid flexure to become adherent, as Kelly suggested, its adhesion is brought about directly and the place of its adherence

is definitely determined. In a case of generalized peritonitis due to bilateral salpingitis in which the tubes and uterus have been removed, the ovaries being left *in situ*, the technique used is described as follows:

If the sigmoid flexure has been adherent over the uterus and appendages, it is freed except for its attachment to the left pelvic wall. Following the removal of the affected organs and the ligation of all bleeding points, the sigmoid is allowed to fall back over the true pelvis so that all raw areas are covered. The round ligaments have been stitched into the cervical stump or over the vaginal vault.

Beginning at the point where the peritoneal coat of the sigmoid is reflected from that of the pelvic wall, a continuous catgut suture is carried along just above the line of the raw tissue on the pelvic wall and just above the corresponding line on the sigmoid flexure as far as the left round ligament. Here the reflected flap of peritoneum belonging to the bladder is picked up and united with the sigmoid flexure across the center of the pelvis until the right round ligament is reached.

From this point on, the right pelvic wall and sigmoid colon are brought into peritoneal approximation as was done on the left side, until the shelf of the pelvis is reached, when the suture passes from the sigmoid to the rectum and is continued, uniting the rectum with the posterior peritoneum as far as the point where the rectal peritoneum is reflected, approximately just to the right of the promontory of the sacrum.

The posterior peritoneal surfaces must be accurately approximated in order to prevent the descent of a loop of ileum through an opening. Occasionally it is necessary to stitch into the intestinal wall when the appendices epiploicæ are absent as a result of extensive inflammatory involvement of the colon. Rotation of the sigmoid one-half or less is necessary in order to come out on the right side of the rectum at the point where the suture ends. This is best accomplished in the mid-pelvis where the vesical peritoneum is brought into use as here flexibility is greater and tension less.

In 518 cases the sigmoid was absent only once, and rarely is it too short to cover unusually extensive raw areas. In the latter case the cæcum may be employed to close the right side of the pelvis, while the short sigmoid covers the left and center. In a series of 543 cases sigmoid-rectal peritonization was done 359 times. In addition, the rectum has been used for partial peritonization sixteen times. The method has been used after total hysterectomy thirty-two times, after subtotal hysterectomy 122 times, after fundal amputation of the uterus 180 times, with round ligament shortening three times, and without hysterectomy five times. The sigmoid was brought up over the bladder twenty-four times, and the cæcum was brought in to cover the right pelvic wall twenty-eight times. An omental graft to cover infiltrated areas of the ileum was employed twenty-eight times.

While typically employed after hysterectomy, this type of peritonization is quite as effective in covering raw areas when the uterus remains *in toto* or when it is decreased in size by fundal amputation. In the majority of the operations the indication lay in

pelvic peritonitis, but the procedure has been found useful also after operations for uterine fibroma, carcinoma, tubal gestation, and ovarian cystoma. Drainage following this type of operation is unnecessary.
N. K. FORSTER, M.D.

SURGERY OF THE HEAD AND NECK

HEAD

Precechtél, A.: Plastic Retro-Auricular Fistulae Following Radical Trephinations (Plastik retro-auricularer Fisteln nach Radikaltrepanationen). *Časop. lékař. česk.*, 1921, LX, 289.

When an opening of considerable size surrounded by scar tissue remains after the radical operation and the retro-auricular fistula lies in a fairly large depression which in itself would require plastic treatment, the author uses the following double-flap method:

After excision of the scar and freshening of the margins of the fistula, a skin and muscle flap is formed from the upper third of the sternocleidomastoid muscle with its base upward. On the lower end of the flap a disc of skin is cut somewhat larger than the depression containing the fistula which is to be covered, and the skin of the rest of the flap is dissected away. The flap is then turned upward so that the disc of skin lies directly upon the fistula. This skin and muscle flap, which lies with its raw side outward, is then covered with a second skin flap with its pedicle posterior to the first flap, which is cut around toward the neck, turned up over the first flap, and fastened with a few stitches. Primary closure of the skin defect on the neck is effected by mobilization of the skin.
KINDL (Z).

Reverchon, L., Worms, G., and Rouquier: Traumatic Lesions of the Hypophysis and Multiple Paralysis of the Cranial Nerves (Lésions traumatiques de l'hypophyse et paralysies multiples des nerfs crâniens). *Presse méd.*, Par., 1921, XXIX, 741.

The authors report the clinical history and autopsy findings in the case of a man 34 years of age who was injured in an automobile accident eight months before his admission to the hospital. At the time of the accident he presented all the symptoms of a basal skull fracture with otorrhagia on the left side and blood in the cerebrospinal fluid. At the time he entered the hospital he had complete paralysis of the facial nerves on the right and left sides and of the motor division of both trigeminal nerves, and complete anaesthesia in the area supplied by the ophthalmic division of the left trigeminal nerve.

Sensibility to all types of stimulation was diminished over the supply of the maxillary and mandibular divisions of both fifth cranial nerves, the decrease being more marked on the left side. The sensory changes also involved the mucous membrane of the nose and mouth. With these changes in sensation there was a bilateral diminution in the

corneal reflexes and corneal ulcerations which were more marked in the left eye. Vision was diminished in both eyes but there was no hemianopsia. The auditory nerves and the tympanic membranes were normal. There was bilateral paralysis of the abducens nerves resulting in an internal strabismus.

During the last two months preceding his entrance to the hospital the patient had suffered a marked loss in weight and had had polydipsia and polyuria. His mentality had degenerated, his memory had become poor, and he was unable to fix his attention.

Roentgen-ray examination of the skull showed an increase in the size of the posterior clinoid process of the sella turcica due to a marked irregular callus formation continuous with a well-defined fracture of the posterior wall of the sella turcica.

The patient suddenly succumbed to cardiac exhaustion accompanied by deep coma. Autopsy showed a transverse fracture extending from one middle cerebral fossa to the other and through the base of the posterior clinoid process. Over the line of the fracture the dura mater was very adherent while the pia mater and arachnoidea were greatly thickened.

The pituitary gland was unrecognizable as such, having been replaced by a small nodular mass enclosed in a dense fibrous capsule. Histologic examination disclosed the presence of fibrous tissue poor in cells but no hypophyseal tissue. There were no gross interruptions in any of the cranial nerves although the fifth, sixth, and seventh nerves were very soft and friable. The gasserian ganglia, and especially the left one, were very adherent to the cavum meckelii, atrophied, and gray in color than normal.

The cranial nerve lesions could all be explained upon the basis of a meningeal hæmorrhage following the fracture. The interesting question arises, however, as to whether the symptoms of diabetes insipidus which were undoubtedly present were due to the pronounced pathology in the pituitary gland or to parahypophyseal injury occasioned by the basal skull fracture. The latter theory is suggested by the animal experiments of Camus and Roussy who caused symptoms of diabetes insipidus by the production of irritative lesions close to the pituitary gland.

The authors compare this case with an earlier case reported by them which was characterized by the syndrome of adiposis genitalis with bitemporal hemianopsia, optic atrophy, and marked enlargement of the sella turcica. This patient gave a history of

a severe head injury some months previous to the onset of the symptoms. X-ray treatments influenced the clinical course of the condition very favorably.

The authors believe there is a direct relation between trauma and the development of certain hypophyseal neoplasms. Their two cases illustrate entirely different types of hypophyseal destruction. In the first case the trauma destroyed the gland directly while in the second case it contributed to the onset of a benign hypophyseal neoplasm.

LOYAL E. DAVIS, M.D.

Baehr, E. M.: Tumors of the Corpus Callosum.
Ohio State M. J., 1921, xvii, 626.

Baehr presents a brief preliminary study of tumors of the corpus callosum with a report of a typical case.

The patient, a man 65 years of age, who had a negative history, suddenly fell to the floor in a state of collapse and remained unconscious for a brief time. The following day he was well enough to return to his office. Before the week had elapsed he had become confused, disoriented, and out of touch with time and events. His mental state was a rather rapidly advancing soporific stupor with loss of all spontaneity and interest which was accompanied by an expression of confusion and daze. He was docile and obedient, knew his family, and for a few days answered questions.

Physical examination revealed no abnormalities except difficulty in defecation and loss of bladder control. The blood pressure was 120 mm., and the discs, reflexes, and urine were normal.

In the course of a few weeks the patient became more and more stuporous and died without ever having paralysis or convulsions.

Postmortem examination of the brain disclosed a large spongy tumor confined strictly to the corpus callosum and symmetrically distributed, extending bilaterally over the striate bodies into the white substance of the frontal lobes. There was complete destruction of the corpus callosum. Microscopic section showed the growth to be a small round-cell sarcoma.

A review of the reported cases indicates that the chief difficulty in diagnosis was due to the symptoms caused by the extension of the tumor and pressure on distant parts.

The syndrome of Bristowe is quoted as an aid to the diagnosis. This is as follows: (1) gradually increasing evidence of cerebral involvement, (2) absence or relative insignificance of signs of increased intracranial pressure, (3) deep disorder of the intelligence characterized by an unusual type of stupor and peculiar non-aphasic speech defects, (4) absence or infrequency of impairment of the cranial nerves, and (5) hemiparetic manifestations with possibly slight impairment of the opposite side.

The author draws the following conclusions:

The mental disorders stand out prominently in all cases: progressive loss of spontaneity, well-defined memory disorders, interruption in the nor-

mal sequence of ideas, and loss of discrimination but conservation of intelligence until late in the course of the process. The author offers a briefer syndrome than Bristowe's, as follows: (1) disorders of intelligence of the type described, (2) absence or insignificance of signs of increased intracranial pressure, (3) absence of definite evidence (Kennedy's signs) of tumor of the frontal lobe, and (4) absence of paralytic or convulsive phenomena until, as the result of encroachment, motor and sensory pathways or the cranial nerves are affected. J. J. LEBOWITZ, M.D.

Tzaico, A.: Autoplasty on the Lower Lip by Doubly Inverting a Flap from the Neck (Autoplastie de la lèvre inférieure par lambeau cervical deux fois renversé). *Presse méd.*, Par., 1921, xxix, 723.

In the complete excision of a carcinoma of the lower lip a large amount of tissue is often removed and in some instances sufficient tissue cannot be turned down from the cheeks or the upper lip to bridge the defect. To repair this area successfully the author has devised a plastic operation which utilizes a flap of skin obtained from the median line of the neck.

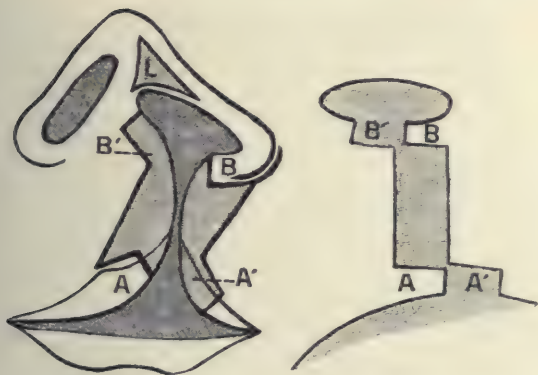
Two longitudinal incisions slightly divergent and about four times as long as the width of the defect are made downward from the angles of the mouth and united by a transverse cut. The skin is then dissected upward so that the base of the flap is in proximity to the lower lip. Care is taken to maintain uniform thickness in the flap. The flap is then turned upward and its edges are sutured to those of the area of defect. The outer layer of skin is then in proximity to the teeth and gingiva but the author maintains that this surface undergoes changes so that ultimately it resembles mucous membrane. The upper end of the flap is then turned downward and its edges are sutured. This brings about a doubling of the original flap and the approximation of its dissected surfaces. The dissected surfaces are accurately and tightly apposed to prevent the formation of a hæmatoma.

If necessary, transverse incisions are made along the inferior border of each mandible in order to resect all glandular tissue. These edges are then united and the original median and transverse incisions in the neck are brought together. Horse-hair sutures are used throughout to prevent unnecessary suture scarring. In the formation of the flap allowance is made for retraction.

LOYAL E. DAVIS, M.D.

Ombrédanne, L.: Restoration of the Lower Border of the Nostril in Simple Harelip. (Restauration du seuil de la narine dans le bec-de-lèvre simple). *Presse méd.*, Par., 1921, xxix, 703.

In harelip operations surgeons have given nearly all their attention to the reconstruction of the lip and have almost entirely neglected the correction of the nostril. When the nostril is not properly reformed there is always decided disfigurement, however well the lip has been reconstructed.



For the reconstruction of the lip Mirault's method as modified by Jalaquier is recognized as the best. In Ombrédanne's opinion a similar procedure should be employed in reconstructing the nose but he uses a symmetrical strip which is cut inversely to that used by Mirault and is formed at the right side. He states that at the two extremities of the labial fissure the same autoplasmic manœuvre must be done exactly on both the buccal orifice and the nostril. To form a good lip, Strip A must join exactly at A', and to form a good nostril, Strip B must join exactly at B' (See figs. above). W. A. BRENNAN.

NECK

Lenormant, C.: Four Cases of Malignant Branchioma (Quatre cas de branchiomes malins). *J. de chir.*, 1921, xviii, 358.

In Lenormant's opinion primary malignant tumors of the neck of branchial origin are not so rare as the textbooks would lead us to believe. The clinical symptoms are sufficiently clear-cut to enable any experienced surgeon to recognize them at once and he will find them quite often if he looks for them. Siegel found six unpublished cases in two years and Lenormant operated upon four cases in the same space of time. Three of the latter four cases had the usual evolution: a hard and irregular kernel appeared deep in the carotid or the carotid-submaxillary region, rapidly invaded the neighboring organs, and showed all the characters of a solid malignant tumor. The fourth was a case of transformation of a branchial cyst.

Several cases of transformation of branchial cysts into malignant branchiomata are reported in the literature. The growth in the author's case was a mixed tumor with both mesodermic and epithelial elements. The majority of tumors of branchial origin are mixed tumors.

Lenormant states that there are certain characters which differentiate branchial cancer from other malignant tumors of the neck and from neoplastic adenopathy. In its size and irregularity, its early adherence and fixation, its quick infiltration of the tissues, and its form, which is that of an indurated

plaque like a breast or parotid cancer, it differs decidedly from a lymphosarcoma and the rarer tumors of the inter-carotid gland.

In the ablation of the tumor it is prudent to remove the regional glands although in forty-nine cases of branchial epithelioma Veau found that they became invaded in only nine. This procedure is tedious, mutilating, and bloody, but not particularly severe. Lenormant's four patients supported the operation well, making a good recovery. Siegel reported nine deaths in sixty cases in which the tumor was completely removed. The unfortunate fact remains, however, that very early recurrence is the general rule. Lenormant's cases form no exception to this rule as there have been three recurrences, one of which appeared within a month after the operation. Operation under such circumstances would scarcely appear justified were it not for the fact that there is an occasional permanent recovery. The author suggests that possibly the combined use of surgery and radium would improve the prognosis.

W. A. BRENNAN.

Bevan, A. D.: Two Cases of Mediastinal Tumor Which Proved To Be Substernal Thyroid Enlargement. *Surg. Clin. N. Am.*, 1921, i, 957.

Both cases reported were those of men past 50 years of age who came to the hospital because of symptoms of mediastinal tumor pressure such as engorgement of veins in the neck and chest, hoarseness due to pressure on the recurrent laryngeal nerve, increasing dyspnoea on exertion, and cyanosis of the face.

At examination percussion revealed an enlarged area of dullness over the mediastinum and more to the right side. The Wassermann test was negative. The X-ray showed a tumor in the mediastinum. In one case there was thyroid gland on the right side of the neck only, while in the other case no cervical gland was palpable.

The treatment was much the same in both cases. Under local anæsthesia an incision was made along the inner side of the sternocleidomastoid muscle, the omohyoid muscle and deep fascia were divided, and the thyroid cartilage and trachea were exposed.

In Case 1 the right thyroid lobe was grasped and pulled upon, blunt dissection was made along the tumor into the mediastinum, and as much of the gland as possible was removed by morcellation after ligation of the superior and inferior thyroid vessels. After considerable hæmorrhage had ensued, the wound was packed with iodoform gauze, which readily controlled the bleeding, and the wound was closed except for a lower opening for the gauze.

In Case 2, in which no glands in the neck were palpable, it was noted that during swallowing a small piece of tissue appeared on the right side. This was grasped with the forceps and by gentle traction the whole mediastinal tumor mass was pulled out of the chest. The mass was found to extend part way to the left side. All the tumor was removed except the left portion.

In both cases the pressure symptoms were greatly relieved, and although in Case 1 infection ensued and what was probably the greater portion of the remainder of the gland sloughed out, both patients were progressing favorably some weeks after the operation.

As supplementary treatment, thyroid gland extract and the X-ray were used.

M. H. HOBART, M.D.

Ochsner, A. J., and Nuzum, J.: Ligation of the Inferior Thyroid Artery and Vein According to the Method Introduced by Professor De Quervain: The Use of Local Anæsthesia in These Operations and in Thyroidectomy. *Surg. Clin. N. Am.*, 1921, 1, 981.

The authors state that the object of this paper is to point out the simplicity, safety, and efficiency of the method of ligating the inferior thyroid artery which was first developed and described by Professor DeQuervain of Berne.

While the simplicity of ligation of the superior thyroid vessels has produced a practically standardized technique, the close relationship of the inferior thyroid arteries to the inferior parathyroid glands, the recurrent laryngeal nerves, and the trachea has produced a variety of methods for ligating the inferior thyroid vessels.

The point where the inferior artery crosses the recurrent laryngeal nerve near the outer border of the trachea has been a favored site for ligation because the adjacent structures can be readily located. Ligation at this site, however, may either directly injure the inferior parathyroid or block its main blood supply. In the former case permanent tetany, and in the latter, transient tetany, may result.

If the inferior thyroid artery is ligated in the course of a thyroidectomy, injury of the parathyroid can be avoided by clamping the lower pole of the gland from without inward and upward so that the vessels and tissue included in the compression are in front of the posterior capsule of the gland and distal to the branch of the artery to the parathyroid gland. By this manœuvre injury of the trachea and recurrent laryngeal nerve is avoided. In view of the safety of ligation by this method, the authors present the query, "Why not in all instances follow the plan of operating in front of the posterior capsule of the thyroid gland?" In cases in which the ligation is a step in the removal of a lobe of the gland, the method described is to be preferred. On the other hand, when the patient's condition is so serious that even a partial thyroidectomy is contra-indicated, too much traumatism is incurred for this to be a safe procedure. In such cases it is essential to employ a method which is simple, which produces the minimum amount of trauma, and which will avoid injuring any important structures either directly or indirectly. The authors feel that the operation developed by Professor DeQuervain fills these requirements.

Only one vessel should be ligated at one sitting and the interval between successive ligations should be at least a week.

The ligation is performed under local anæsthesia. The incision is made in the line of the Kocher transverse collar incision to be used at the deferred thyroidectomy. In this line a transverse incision 3 cm. in length and 3 cm. above the clavicle is made at the outer border of the sternocleidomastoid muscle. The posterior attachment of the muscle is loosened and the carotid artery is exposed by blunt dissection extending 5 cm. along the outer margin of the muscle. The inferior thyroid artery may then be located by gentle exploration with the finger near the center of the free space in front of the carotid artery. Caution is essential to avoid rupturing the inferior thyroid vein. The inferior thyroid artery is exposed for a distance of 1 cm. from its origin and closed by two ligatures 1 cm. apart. After tightening of the ligatures, but before the knot is secured, the patient should be asked to speak and to cough as hoarseness will indicate that the recurrent laryngeal nerve is in an aberrant position and has been included in the ligature.

If a second ligation is indicated, it is well to expose also the ima thyroid artery and the external jugulars and to ligate these if they are found to be enlarged.

The authors sum up the advantages of this procedure as follows: "There is no danger of injury by this operation to the parathyroid gland, the recurrent laryngeal nerve, or the trachea either directly or indirectly because the field of operation does not approach these structures sufficiently to permit direct trauma, and there is always a sufficient amount of collateral circulation so that the nutrition of the inferior thyroid gland will not be interfered with." They claim also that "the benefit is greater from ligating one inferior thyroid artery than from ligating both superiors, and if this method is followed the resulting trauma is less than that resulting from the ligation of one superior thyroid artery."

The balance of the article is devoted to a presentation of the authors' method of performing thyroidectomies under local anæsthesia. The advantages of local anæsthesia as against general ether anæsthesia have been so generally presented that it is not necessary to recapitulate here the eleven points listed.

The patient receives two hypodermic injections of $\frac{1}{4}$ and $\frac{1}{6}$ gr. of morphine respectively and $\frac{1}{150}$ gr. of atropine sulphate, the first two hours and the second one hour before operation. The local anæsthetic is prepared according to the following formula:

Apothésène. gm. 0.6 — gr. 7.5
Sodium chloride. gm. 0.8 — gr. 12.
Aqua destillata. q. s. ad 10 c. cm.

This is sterilized by boiling for from three to five minutes. Three and one-half ounces of this solution are generally used. Anæsthesia is complete within three to five minutes and lasts for one to two hours. Anæsthesia is secured by the intradermal

and subcutaneous injection of the apothesine solution and the blocking of nerve trunks. The regional points and the method of injection are shown by plates.

The presentation includes an analysis and summary of the results of the method in 107 consecutive

cases including all types of goiter from marked exophthalmic to simple colloid goiters. In this series there were no deaths; in each case liquid nourishment was taken immediately after the operation and the patient was discharged from the hospital at the end of one week. W. O. JOHNSON, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Eisendrath, D. N.: The Lymphatics of the Female Breast in Relation to Carcinoma of the Breast.
Surg. Clin. N. Am., 1921, 1, 1025.

The three cases presented bring up the question of the frequency with which primary involvement of the subclavicular and supraclavicular lymph nodes occurs in carcinoma of the breast, and the question as to what change is necessary in our radical operation to conquer this regional invasion. In the discussion of the conditions in which an exploration with removal of all lymph-node-bearing fat of the subclavicular and supraclavicular regions is justified, attention is directed to Mornard's investigations of the relation of the lymphatics of the breast by means of injection.

Five types of lymphatic drainage toward the axillary, subclavicular, and supraclavicular nodes are described. Type 1, found forty-five times in 100 breasts, is the classical type, consisting of three to five lymphatic trunks leaving the outer and lower border of the mammary gland and reaching the central group of lymph nodes lying on the axillary vein. The first set of relay nodes were those lying along the outer border of the pectoralis major muscle. When the injections passed beyond these pectoral and axillary nodes the fluid reached the subclavicular nodes and in some cases even the supraclavicular nodes.

In Type 2 the lymphatic trunks lead to the outer axillary chain. This type was found in twelve breasts.

In Type 3, found in thirty-five breasts, there are two lymphatic trunks, axillary and subclavicular. One of these is the classical type described as Type 1. The other lymphatic trunk is formed by two or three smaller ones which leave the upper inner portion of the breast. These trunks proceed directly to the group of nodes lying beneath the clavicle and pass upward beneath the pectoralis minor near its costal insertions. When this type is present a single barrier formed by the subclavicular nodes separates the breast from the supraclavicular nodes. In twenty cases the axillary and subclavicular territories were completely independent.

In Type 4 lymphatic trunks are found between the two pectorals. This type closely resembles the third type, but the trunk to the subclavicular nodes passes between the pectoralis major and minor muscles.

In Type 5, found in three breasts, the lymphatic trunks lead directly to the supraclavicular nodes. This explains how the axillary nodes may be spared while an early invasion of the supraclavicular nodes occurs, especially in cancers of the upper inner quadrant.

The author describes two sets of supraclavicular nodes, and states that he is not yet convinced of the necessity for the removal of the lymph-node-bearing fat of the supraclavicular region as a routine procedure in the radical operation. In cancer of the upper half of the breast, however, as in three cases described, all of the fat and other tissues as far as the clavicle, and if possible to the subclavian vein itself, should be removed.

J. D. ELLIS, M.D.

Greenough, R. B., and Simmons, C. C.: End-Results in Cancer Cases; Cancer of the Breast.
Boston M. & S. J., 1921, clxxxv, 253.

The authors report on 103 personally observed cases of cancer of the breast and offer a method of classification which they have found satisfactory in a study of the cases occurring at the Massachusetts General Hospital. The scheme for the reporting of the end-results of the treatment of carcinoma may be summarized as follows:

A. Record all cases entering the surgical wards with the specified diagnosis during the period selected.

B. Eliminate all re-entries. No case should appear twice in the report.

C. Eliminate all cases recurrent after previous operation in a hospital or elsewhere; these are not cases of primary attempt to cure.

D. Deducting $B + C$ from A , we have the number of cases of cancer available for the study of operability, mortality, and other operative statistics. These cases may be subdivided as follows:

E. Cases of radical operation.

F. Cases of palliative operation.

G. No operation advised or performed.

H. Operative deaths.

I. Operative mortality, $H \div E + F$.

J. Operability (radical operations), $E \div D$.

K. Operability (all operations), $E + F \div D$.

For the study of the end-results of treatment certain cases included in D are of no value and should be deducted, viz.:

L. Cases proved not to be cancer, either by pathologic examination of tissue, absence of recurrence, or autopsy.

M. Cases of patients untraced for the required time-interval — three years, five years — after they left the hospital.

N. Cases of patients who have died of other diseases within the required interval of time and without evidence of recurrence.

O. The cases remaining after deducting L, M, and N from D are available for the study of end-results as follows:

P. Radical operations.

Q. Palliative operations.

R. No operation.

S. Number of patients alive without recurrence (three years; five years).

T. Number of patients who have died (after three or five years) without recurrence.

U. Number of three-year or five-year "cures." All operations. $S \div T$.

V. Number of three-year or five-year "cures." Radical operations.

W. Percentage of three-year or five-year "cures." All operations. $U \div P + Q$.

X. Percentage of three-year or five-year "cures." Radical operations. $V \div P$.

Using this method for reporting end-results the authors submit the following table comparing the results obtained in cancer of the breast at the Massachusetts General Hospital for the periods 1894 to 1904 and 1911 to 1914, each case having been studied over a five-year period.

END-RESULTS: CARCINOMA OF THE BREAST

	1894-1904	1911-1914
A. Total entries — carcinoma of breast.....	613	115
B. Re-entries (entered more than once).....	80	8
C. Recurrence from previous operation.....	65	4
D. Cases available for study of operability, mortality, etc....	468	103
E. Radical operation.....	360	74
F. Palliative operation.....	56	20
G. No operation.....	52	9
H. Operative deaths.....	15	0
I. Operative mortality (H+E+F).....	3.6%	0%
J. Operability: radical operations (E+D).....	77%	72%
K. Operability: all operations (E+F+D).....	89%	91%
L. Inconclusive cases: lack pathologic examination.....	0	0
M. Inconclusive cases: untraced..	38	5
N. Inconclusive cases: death within time limit without recurrence.....	2	3
O. Cases available for end-result data.....	428	95
P. Radical operations.....	320	69
Q. Palliative operations.....	56	17
R. No operation.....	52	9
S. Number of patients alive and well.....	64	22
T. Number of patients who died without recurrence.....	7	1

U. Number of five-year "cures," all operations.....	71	33
V. Number of five-year "cures," radical operations.....	67	22
W. Percentage of "cures," all operations ($U \div P + Q$).....	19%	27%
X. Percentage of "cures," radical operations ($V \div P$).....	21%	32%

The following table gives the results obtained in 67 cases of primary radical operation, the cases being classified according to the type of carcinoma:

	Cases	"Cures"	Percent-ages
Scirrhus.....	8	1	12½
Medullary.....	17	6	35
"Cancer".....	34	11	32
Adenocarcinoma.....	6	2	33
Colloid.....	2	2	100

In order to estimate the prognosis in 95 traced cases they were further classified according to the conditions found at operation.

Class	Condition	Cases	"Cures"	Percent-ages
1	Early favorable (no enlarged glands).....	14	10	71
2	Favorable (glands slightly enlarged).....	26	9	33
3	Average cases (glands markedly enlarged).....	29	3	10
4	Advanced cases (palliative operation).....	17	1	5
5	Hopeless cases (no operation).....	9	0	0

R. C. WEBB, M.D.

Kilgore, A. R.: Is Paget's Disease of the Nipple Primary or Secondary to Cancer of the Underlying Breast? *Arch. Surg.*, 1921, iii, 324.

On the basis of intensive study the author has come to the conclusion that the term "Paget's disease" should be limited to those lesions presenting the typical histology: (1) epithelial hypertrophy; (2) subepithelial round-cell infiltration, and (3) Paget's cells.

All the cases of Paget's disease reported emphasize the importance of removing the entire breast for any chronic, persisting eczema or ulcer of the nipple, regardless of the apparent presence or absence clinically of deeper breast changes. At operation, the decision for or against axillary dissection should depend, not on frozen-section diagnosis of the nipple condition as regards true Paget's disease and other eczemas, but on the pathologic condition of the breast itself. The best procedure is amputation of the breast with a wide zone of skin, the knife cautery being used in cutting across the lymphatics leading to the axilla and axillary dissection being done immediately if any gross or frozen-section evidence of cancer is found in the excised breast.

Three cases are reported which demonstrate that Paget's disease is usually primary to cancer of the breast which has been found frequently in association with it. In one of these cases no change whatever had occurred in the breast, and in two cases the early changes of what was probably duct carcinoma had begun when the breast was excised. A fourth case is reported in which all the evidence of the history and pathology pointed to a reversal of this order, the cancer in the breast apparently having originated first. If the deductions in these cases are correct, both schools in the controversy regarding the primary or secondary nature of Paget's disease have been right. H. A. McKNIGHT, M.D.

TRACHEA AND LUNGS

Whittemore, W., and Chaffin, G. L.: *Extrapleural Thoracotomy for Advanced Unilateral Pulmonary Tuberculosis; Report of a Case.* *Boston M. & S. J.*, 1921, clxxxv, 249.

Artificial pneumothorax produces marked beneficial results in many cases of pulmonary tuberculosis but cannot be used in 25 per cent of the cases because adhesions prevent the collapse of the lung. Bauer and Friedrich in 1907 suggested thoracoplasty for the latter type of case. The original mortality rate of 25 per cent has been greatly reduced so that today the procedure is comparatively safe.

The authors report a case treated at the Massachusetts General Hospital. The patient was an Italian laborer, 34 years of age, who gave a history of tuberculosis of eight years' duration. All the clinical signs of advanced pulmonary tuberculosis were noted on the right side but none on the left side. Operation was performed after the method of Paulsen and Sangman under regional and local infiltration anaesthesia. The incision extended parallel to, and about 3 cm. from, the spine and then laterally along the tenth rib. Subperiosteal resection of sections of the upper eleven ribs, beginning at the eleventh and working upward, was done. The sections removed ranged in length from 2 to 11½ cm., the upper sections being the shorter. After the completion of the rib resection the parietal pleura was freed from the chest wall forward and backward, a rubber dam drain was inserted, the wound was closed, and a chest belt was applied to cause pressure on the right lung.

Following the operation the patient gained rapidly. After two and one-half months he left the hospital and went to a tuberculosis sanatorium where he continued to gain for four months more. He then felt so well that he went to work but suffered a relapse. This, however, yielded to hygienic treatment and at last reports he was again rapidly improving.

The authors feel that although the case reported is by no means cured, the marked improvement shown justifies the operation performed. Several roentgenograms and illustrations are included in the article.

ROSCOE C. WEBB, M.D.

HEART AND VASCULAR SYSTEM

Braizew, W. R.: *Surgery of the Heart* (Zur Chirurgie des Herzens). *Nautschnaja med.*, 1920, No. 3.

The author takes up the question of the removal of foreign bodies from the heart. The indications for operation are to be considered with caution. In the case reported by Braizew there were severe heart attacks and marked dyspnoea. Any foreign body in the heart may eventually cause inflammation or scar tissue. When an operation is necessary for the removal of foreign bodies, the resection of ribs is not to be considered. Braizew obtained access to the heart by resecting the fifth costal cartilage. If necessary, the upper and lower costal cartilages may be separated at the sternum and drawn back with a retractor. The costal cartilages so handled by the author healed back in place without any difficulty. In the case reported the heart stopped whenever traction was applied to it.

Braizew tested the resistance of the heart by experiments on animals. He found that a dog's heart withstands compression of the right ventricle for two or three minutes. The most dangerous procedure is luxation of the heart out of the wound which causes traction on the large vessels. In the dogs experimented upon the heart finally stopped. In clinical surgery, however, there have been cases in which such manipulation did not cause any untoward results.

In suturing, the wound edges must both be grasped in one and the same movement. The author recommends the placing of two preliminary sutures, one on either side of the site of the foreign body. The heart must be sutured with silk. The suture should be so introduced that the intima is not included.

Dujarier and Kostenko recommend catgut for heart sutures. The author used catgut No. 4 to sew the wall of the right ventricle in animal experiments. After five days the catgut was absorbed and the dog died from hæmorrhage. Catgut therefore should not be employed for wounds that perforate into the heart cavities. The author did a two-row suture of the heart in which, beside the interrupted suture, he employed also a thin silk suture. He hopes in this manner to prevent postoperative adhesions. The case operated upon by Braizew was as follows:

A 24-year-old man received a shrapnel wound of the chest four months previously. The bullet entered the posterior wall of the thorax at the lateral edge of the scapula at the level of the fifth rib. A pleural exudate on the right side, high fever, dyspnoea, and palpitation of the heart developed. At intervals there was pain in the heart region. The pulse was 120. The patient wore a compression band to prevent thorax widening. The heart was enlarged to the left. The X-ray showed the bullet in the right ventricle. Operation was performed under combination anaesthesia.

An arched parasternal incision was made extending along the sixth costal cartilage. The pleura

bulged outward. The mammary artery was ligated and a pericardiotomy was done. On palpation the projectile was found to be firmly embedded in the connective tissue. After extraction the myocardium was sutured with three interrupted sutures of silk. The first line of sutures was then covered by suture of the epicardium. The costal cartilage was replaced and a tampon inserted. The tampon was removed on the fourth day.

The patient made an uneventful recovery in spite of postoperative bronchitis. He was discharged from the hospital at the end of two months in excellent condition. Some palpitation occurs when he runs and there is still slight enlargement of the heart to the left. The X-ray shows no pericardial adhesions. The electrocardiograph shows a slight functional derangement of the myocardium. After three and one-half months the results still remain excellent.

HESSE (Z).

PHARYNX AND ŒSOPHAGUS

Sencert, L., and Simon, R.: The Operative Treatment of Idiopathic Dilatation of the Œsophagus (Le traitement opératoire de la dilatation idiopathique de l'œsophage). *Rev. de chir., Par.*, 1921, xl, 355.

The authors report a case of œsophageal dilatation of unknown cause. On examination with the X-rays following the ingestion of a barium meal an enormous pouching of the œsophagus was found which rested upon the diaphragm. There was no obstruction to the passage of sounds or catheters. The symptoms had become gradually worse for twenty-three years. At the time of examination the dilatation made it necessary for the patient to straighten his body, raise his shoulders, protrude his abdomen, and take a deep inspiration in swallowing his food.

There is entire agreement regarding the symptoms, clinical course, diagnosis, and prognosis of idiopathic dilatation of the œsophagus. The pathogenesis may be spasmodic occlusion of the cardia or congenital atony of the œsophageal musculature. Sencert and Simon consider the condition analogous to megacolon and due to inability of the muscular tissue to withstand the normal intra-œsophageal pressure. By their diagnostic measures they have shown that there is no organic obstruction in the cardia in these cases. On the basis of this finding it is evident that the usual treatment of dilatation, divulsion or cardioplasty, is incorrect as both of these procedures are directed toward removing an obstruction and re-establishing the cardiac orifice. The authors have therefore devised a new operative technique as follows:

Through an abdominal incision the œsophageal opening of the diaphragm is dilated and the œsophagus is pulled downward into the abdominal cavity for about 8 cm. The œsophagus is then fixed in its new position to the borders of the œsophageal orifice of the diaphragm. If necessary to permit rapid evacuation of the œsophagus, a longitudinal

incision 4 cm. long, including the stomach wall at its lower extremity, is made and closed by transverse sutures in two layers.

LOYAL E. DAVIS.

Ladwig, A.: A Remarkable Case of Malformation of the (Œsophago-Tracheal Tube, with a Contribution to the Interpretation of the Formal Genesis of These Malformations (Ein bemerkenswerter Fall von Missbildung des Œsophago-Trachealrohres, zugleich ein Beitrag zur Auffassung von der formalen Genese derartiger Missbildungen). *Zentralbl. f. allg. Pathol. u. pathol. Anat.*, 1921, xxxi, 613.

The author had the opportunity to observe a rare form of tracheo-œsophageal malformation in a child which was born prematurely (between the twenty-eighth and thirtieth weeks) and died three days later from bronchopneumonia. In this case no food at all was retained. Autopsy showed that the œsophagus ended blindly at the level of the bifurcation of the bronchi. From the gastric end probing led into the trachea. There were, therefore, two distinct parts to the œsophagus, an upper part ending in a dilated blind sac, and a lower part ending in the trachea. In addition, the left kidney and ureter were absent and the right lung showed extensive bronchopneumonia.

Blind ending of the œsophagus with a slit opening of the lower end into the trachea is one of the common malformations of œsophageal atresia. The interesting finding in the case reported was the wide communication of the lower end with the trachea. Microscopic examination showed that after opening into the trachea the œsophagus was continued in the tracheal wall for some distance as all its structures—circular and longitudinal muscle fibers, glands, and stratified epithelium—were found there. This malformation has been observed before, and according to the author is best explained by the theory of Klebs, Giffhorn, and Hoffmann, according to which the embryonic folds intended to separate the œsophagus and trachea grow in an abnormal direction.

GANGEL (Z).

Lillenthal, H.: Carcinoma of the Thoracic Œsophagus; Extrapleural Resection and Plastic. *Ann. Surg.*, 1921, lxxiv, 259.

The operation described was devised to minimize the danger of septic mediastinitis. It was recognized that before opening the œsophagus the mediastinum must be sealed off by a healing process which should have advanced to the stage of granulation.

The patient was a 35-year-old man with a partially obstructing squamous-cell carcinoma below the arch of the aorta.

At the first step the operator lifted a skin flap about 3 in. in width and 10 in. in length which was outlined by an incision beginning at the eighth interspace close to the spine and passing obliquely forward parallel with the ribs and thence downward and backward to a point about 3 in. below the point at which it began. This flap was used in fashioning the new œsophagus to replace the resected part.

A 6-in. subperiosteal resection of the ninth rib was then done and the pleura stripped forward away from the posterior mediastinal region. The eighth, seventh, and sixth ribs were cut through near their spinal attachments after the pleura had been peeled away and then the tenth rib also was divided. The pleura could now be pushed forward so that the organs within the mediastinum were exposed through a wound large enough to permit the surgeon to work in its depths with both hands.

With a stomach tube in the œsophagus this structure was easily identified and stripped from the pleura and aorta. The fibers of the plexus gulæ of the right vagus were divided. The fusiform swelling which marked the tumor within the gullet was about $1\frac{1}{2}$ in. below the arch of the aorta. The skin flap was placed in the wound so that it partly encircled the mobilized œsophagus and its cutaneous surface was toward the viscus. This first step of the operation was concluded by packing the wound with gauze. The patient was then able to swallow fluids.

Two weeks later, without anæsthesia of any kind, the wound was spread apart and the tumor-bearing section of the œsophagus was resected. Nourishment was first given through a stomach tube passed into the lower œsophageal opening and later through an Einhorn tube passed from the mouth to the stomach through the gap left by the resection. At the end of another week the pedicle of the skin flap was cut across. Subsequently there was contraction of the cicatricial tissue at the mucocutaneous margins making it necessary to divide the strictures by stellate incisions and pass bougies frequently. The final step consisted in closing the posterior œsophageal opening with a suture and performing a plastic operation to cover the defect in the patient's back with skin by the use of sliding flaps. A few days after this final procedure liquids could be swallowed without leakage, and soon all wounds were healed and soft food could be taken normally.

A number of drawings made at the operation are reproduced in the article. There are also roentgenograms and a photograph.

Other cases in which the same exposure was effected are reported but all proved inoperable. The conclusions drawn are as follows:

1. Transpleural resection of the œsophagus has a forbidding mortality.
2. Fatal infection follows the primary opening of the œsophagus within the mediastinum.
3. It is feasible to make an extrapleural exposure of the posterior mediastinum large enough to permit the operator to see clearly and to work safely with both hands.
4. Resection of the œsophagus in the posterior mediastinum can be done by performing the operation in two stages. In the first stage, the œsophagus should be freed from its attachments and the mediastinum sealed. In the second, ten to fourteen days later, the resection should be performed.
5. This procedure deserves a fair trial by thoracic surgeons.

MISCELLANEOUS

Stincer, E.: A Foreign Body Extracted from the Posterior Mediastinum by Posterior Thoracotomy (Cuerpo extraño del mediastino posterior; extracción por toracotomía posterior). *Rev. de med. y cirug. de la Habana*, 1921, xxvi, 767.

The patient whose case is reported by Stincer was a young man who had been operated upon for purulent pleurisy two years previously. The drainage tube broke because of poor condition of the rubber and a part of it remained in the pleuropulmonary cavity. Its presence ultimately gave rise to a fistula. A posterior thoracotomy was therefore performed to remove it.

The operation showed that the fragment of drainage tube had perforated the left lung and lodged in the posterior mediastinum where its upper end touched the pleural vault. Its position was oblique from above downward and from left to right. The only damage resulting from its wandering was the suppurative fistulous tract. The removal of the tube was very difficult but successfully accomplished. The patient rapidly recovered.

W. A. BRENNAN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Erkes, F.: Sliding Hernia of the Intestine (Der Gleitbruch des Darmes). *Ergebn. d. Chir. u. Orthop.*, 1921, xiii, 466.

Sliding herniæ occur only on the right and left sides of the body in the corresponding parts of the large intestine and its appendages; in other words, in the ascending colon, the cæcum, the appendix, the ileum, and the descending colon. Congenital cases are due to developmental defects. As causes of the occurrence of the so-called acquired sliding hernia are given weakness of the subperitoneal tissue, atony, obstipation, and, rarely, trauma. A frequent

cause is a previously present large hernia of the small intestine which, especially on the right side, draws down the parts secondarily with the parietal peritoneum. The author distinguishes herniæ with and without a hernial sac, suspended herniæ, and internal sliding herniæ of the cæcum in the right iliac fossa.

The diagnosis of a sliding hernia is uncertain but is suggested by severe pain, incomplete reduction, or slight bulging during coughing. A truss is of no value. Operation is the treatment of choice. Three operative methods are used: (1) reduction *en masse*; (2) resection of the sac and suture; and (3) a plastic operation on the mesentery. The results

are usually good. Operation has numerous technical difficulties. Incarceration and appendicitis are serious complications. According to statistics, the mortality of the operation is 3 per cent. This form of hernia occurs more often in adults than in children. Its incidence is 1.1 per cent. WEICHERT (Z).

Augé, A., and Simon, R.: Herniæ of the Semilunar Line of Spiegel (Contribution à l'étude des hernies de la ligne semi-lunaire de Spiegel). *Rev. de chir.*, 1921, xl, 297.

In the authors' opinion the term "ventral hernia" is too general. Herniæ of the anterior abdominal wall should be described according to their location. A true, spontaneous herniation through the semilunar line of Spiegel is rare. The authors report a case.

In this condition there is an egg-shaped tumefaction at the level of the umbilicus at the lateral border of the rectus muscle. The mass is partially reducible in the recumbent position and is increased by coughing and otherwise increasing the intra-abdominal pressure. In about half the cases the hernia is covered by the peritoneum, subcutaneous tissue, and skin, and in the other half by the external oblique in addition. The border of the hernial orifice is upon the rectus sheath and is usually indurated and firm. There was no hernial sac in the case described in this article.

The authors believe that this type of hernia is due to a congenital malformation—complete absence of the muscular wall of the abdominal cavity or an anomaly of the vessels of the abdominal wall. Such anomalies open the way for the exciting factor of increased intra-abdominal tension or trauma to the abdominal wall. Lipomata and fibromata of the abdominal wall must be taken into consideration in the differential diagnosis. The authors have reviewed all of the cases reported in the literature.

LOYAL E. DAVIS, M.D.

Blumenau, M. B.: Diaphragmatic Herniæ (Zur der Diaphragmalhernien). *Nautschnaja med.*, 1920, 715.

The subjective symptoms of diaphragmatic hernia consist of pain, a sense of pressure chiefly on the left side, dysphagia, vomiting, and obstipation. Their severity is dependent upon the state of fullness of the organs which have entered the chest. In rare cases, especially those of children and young persons, there is dilatation of the chest on the involved side. The affected side breathes more weakly than the normal side. If the organs in the hernia contain air there is tympany; if they contain liquid, there is dullness. When there is tympany the breath sounds cannot be heard. If the lung is compressed there is bronchial or amphoric breathing. Often intestinal sounds are audible. When the hernia contains fluid and air succussion sounds may be heard.

In hernia on the left side the heart is often forced over to the right. When there is severe compression of the heart systolic sounds arise from kinking of the large vessels. These signs suggest the picture of a

pneumothorax with a pleural exudate. Diaphragmatic hernia can be differentiated from the latter condition, however, by: (1) frequent changes in the auscultation and percussion phenomena due to changes in the fluid and gas content of the organs; (2) intestinal sounds; (3) the absence of causes predisposing to pneumothorax (trauma, tuberculosis); and (4) in doubtful cases, aspiration, inflation of the stomach, and high injections into the intestines. The X-ray examination is of the greatest value. The author's case, which was not operated upon, was as follows:

The patient was a 22-year-old soldier who, following a sudden chill, suffered pain in the left side of the breast and attacks of coughing, dyspnoea, hæmoptysis, obstipation, and vomiting. His pulse was 125 and respiration 50. The left side of the chest was totally dull. The heart boundary was not definable. Bronchial breathing and crepitant râles were noted. The breath sounds were weakened in the back on the left side. The abdomen was tense and distended. Peristalsis was absent. The temperature was 101 degrees. Injection was without result. The patient died on the tenth day of his illness and the fourth day after he entered the medical clinic. The diagnosis was ileus and fibrinous pneumonia. A surgeon was not consulted. At postmortem examination the colon, the entire great omentum, and a foul exudate containing numerous colon bacilli were found in the left pleural cavity. In the diaphragm was a slit through which these parts protruded. The left lung was compressed and dislocated. Hæmorrhagic pleurisy on the right side and atelectasis were found. The pneumonic signs were obscured by the compression of the lung.

HESSE (Z).

Dodgson, H.: Traumatic Rupture of the Diaphragm; Patient Lives Over Two Years. *Practitioner*, 1921, cvii, 219.

This paper is based on an autopsy performed on the body of a coal miner who, two years before his death, had received a crushing injury under a mass of coal.

Examination showed a circular aperture about 4 in. in diameter in the center of the left half of the diaphragm. In the left pleural cavity anterior to the lung were found half the stomach, a considerable portion of the transverse and descending colon, and several coils of small intestine. The right lung was in a condition of consolidation, the immediate cause of death.

The author has been able to find the report of only one other similar case in which the patient lived any considerable length of time.

I. E. BISHKOW, M.D.

Cambresier, G.: The Surgical Treatment of Ascites (Traitement chirurgical de l'ascite). *Arch. méd. belges*, 1921, lxxiv, 640.

For more than thirty-five years there have been numerous attempts to treat ascites surgically.

The diversity of the methods employed indicates the complexity of the problem and the fact that simple paracentesis is not satisfactory. The surgical mortality in ascites is high, being 30 per cent, but the causal affection, if left to itself, has an unfavorable prognosis and is often rapidly fatal.

One of the factors favoring surgical intervention in ascites is the light which laparotomy throws on the nature of the causative condition.

The author considers in detail the principal operative methods which, he states, may be divided into two classes: (1) those having as their object the anastomosis of the portal vein to the vena cava; (2) those having as their object permanent drainage of the ascitic fluid toward some other point in the body. From a review of the results of these methods he comes to the following conclusions:

1. In cases of ascites laparotomy has brought lesions to light which medical or surgical treatment has been able to overcome.

2. Mutilating operations are unnecessary.

3. Anastomosis of the portal vein to the vena cava interferes with the antitoxic rôle of the liver by withdrawing a considerable quantity of blood from the hepatic circulation. This explains many postoperative deaths.

4. Frequently the drainage routes are obstructed by peritoneal adhesions.

5. Voluminous cystic pockets may be formed in the anterior abdominal wall following operations draining the fluid toward this region.

6. In view of the fact that the causal condition will be fatal if left to itself, operation should be considered, as a number of definite recoveries have resulted from such treatment. W. A. BRENNAN.

Deaver, J. B.: Peritonitis. *N. York M. J.*, 1921, cxiv, 257.

The author introduces his article with the statement that the salient points of a subject so important as peritonitis do not suffer from being repeated from time to time.

He describes the mechanism of the equilibrium between exudation and absorption which, in the absence of a pathologic process, prevents the accumulation of even a small amount of free fluid in the peritoneum. In discussing the types of peritonitis he states that he is inclined to believe that the so-called chemical and the idiopathic peritonitis are really infective. The bacterial flora of peritonitis is generally a mixed one.

The dangers of purgation in early peritonitis, as for instance in early appendicitis, are emphasized, as are also those of poor selection of cases or stages of appendicitis in which to operate.

When an abdomen is opened in a badly infected case in which the peritoneum in the immediate vicinity of the lesion is green and there is foul-smelling pus, the infected cavity should be surrounded by a rubber dam or oiled silk and lightly packed with gauze, the wound being left open but silkworm gut being carried through the margins

and tied loosely to prevent protrusion of the intestines. The packing should remain in place for several days. Purgation is as ill advised during the postoperative treatment as before operation.

J. D. ELLIS, M.D.

GASTRO-INTESTINAL TRACT

Palmer, E. P., Watkins, W. W., and Mills, H. P.: Linitis Plastica. *Surg., Gynec. & Obst.*, 1921, xxxiii, 281.

Linitis plastica is known under a variety of names. It affects the stomach, involving the small intestines only rarely and by extension. It produces diffuse and marked hypertrophy of the sub-mucous connective tissue and to a lesser degree of all the coats of the stomach except the mucosa where there is an atrophy of the glandular elements. The stomach wall is thickened to six to eight times its normal thickness and becomes rigid like a leather bag. Its lumen is decreased. The thickening is most marked at the pylorus.

The chief characteristics of linitis plastica are a slow progressive stenosis of the stomach resulting in food stagnation and often a perceptible tumor in the epigastric region, with absence of pain, hæmorrhage, and early vomiting. The localized form of this condition is situated near or at the pylorus. The disease is most common between the ages of 40 and 60. It is classified as both malignant and benign.

The symptoms are slow in onset and are those of a progressive obstruction with loss of weight and cachexia. The condition is often mistaken for scirrhus carcinoma and scirrhotic syphilis of the stomach.

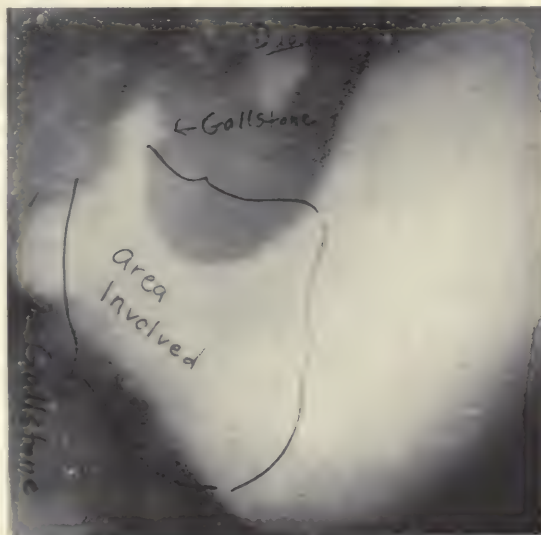


Fig. 1. Roentgenogram of stomach showing area of involvement in linitis plastica.

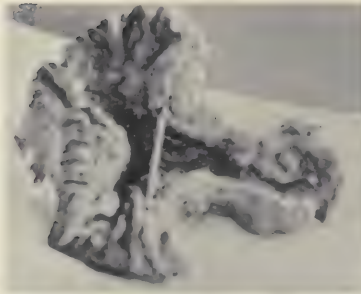


Fig. 2. Interior view of resected portion of stomach.

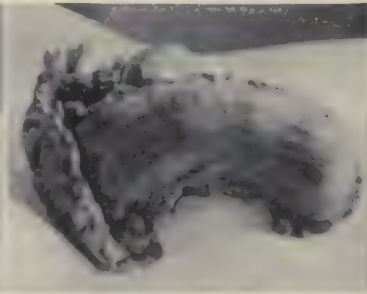


Fig. 3. Exterior view of resected portion of stomach.

(*Linitis Plastica* — Palmer, Watkins, and Mills.)

The X-ray offers the best differential diagnosis. It shows a filling defect with a smooth inner margin and the absence of peristalsis in the involved area.

Treatment is always operative. Gastrectomy is the operation of choice.

A case is reported with the detailed pathologic findings.

I. E. BISHKOW, M.D.

Schoenfeld, H. E. H.: When Should Gastric Ulcers Be Treated Surgically and How? (Wann muss bei Magengeschwuerkranken eingegriffen werden und wie?). *Nederl. Tijdschr. v. Geneesk.*, 1921, Lxv, 1996.

Schoenfeld raises the following questions:

1. In which forms of gastric ulcer should internal treatment give way to surgical treatment and what complications demand operation?

2. What method of operation is best, especially when there are complications?

3. Is it possible to obtain permanent results by surgical procedures, and what method gives the best results?

Routine early operation is not to be considered as the isolated, uncomplicated ulcer and the acute (usually multiple) ulcer belong to the internist. While occasionally dangerous complications may develop, healing usually occurs smoothly and without any significant scar. Internists admit, however, that their treatment is satisfactory in only about 50 per cent of the cases. Moreover, the patient's social condition and the severity of the symptoms must be taken into consideration.

Operation is indicated in the following cases:

1. Stagnation of gastric contents due to stenosis or hour-glass stomach which does not yield to any other treatment. If a gastro-enterostomy is performed in such a case, it must be done on the fundus, a procedure which is difficult as this part of the stomach is under the ribs. For this and other reasons, resection is recommended.

2. Perigastritis with adhesions to surrounding tissue. Often the small adhesions cause more difficulty than the large ones.

3. Persistent hyperacidity, especially with dilatation and weakness of the stomach musculature. It is in these cases that gastro-enterostomy is most used.

As hypersecretion and disturbances of motility of the stomach are dependent upon the tonicity of the vagus nerve, section of the vagus at the cardiac end has been suggested but this procedure has not yet been generally accepted. The results of gastro-enterostomy have become better since the pylorus has been closed or narrowed. Without such closure stagnation is apt to recur. According to Rosenheim, the gastro-intestinal anastomosis forms a sphincter. Ewald assumes the formation of a valve-like closure. The highest figures for the hydrochloric acid content are reported by surgeons; therefore surgeons must receive more cases with disturbances of motility. These perhaps are due to retention of secretion. Also in cases of ulcer located some distance from the pylorus there is a spasm of the pyloric muscles and the circular muscle layers at the level of the ulcer. Perhaps this is responsible for the stagnation of the secretion or the lack of neutralizing duodenal secretion. At any rate, in these cases gastro-enterostomy is very effective.

4. Ulcers which, by their long duration and repeated bleeding, threaten life, i.e., callous ulcers. These undoubtedly should be resected as in such cases there is also the danger of carcinomatous change. Perforation may occur very suddenly. Often it is the first sign of a latent ulcer. The prognosis depends on the time at which operation is performed. Shock is not a contra-indication. In cleansing the abdominal cavity one must not forget the Douglas pouch. American surgeons drain it toward the rectum or suprapubically and by so doing have decreased the death rate to 19 per cent. In doubtful cases an exploratory laparotomy is advisable. Morphine tends to obscure the picture. The prognosis with regard to the bleeding is relatively favorable unless very large vessels are eroded. Often it is impossible to discover the point of hæmorrhage with the naked eye. Several authors attribute to gastro-enterostomy an indirect effect

such as the removal of the irritating blood masses, antiperistalsis, hyperacidity, and hypersecretion. Jejunostomy also is recommended to quiet the stomach. These procedures are without influence on hard-walled callous ulcer. When hæmorrhage is repeated, operation is indicated as the next hæmorrhage may be fatal. Gastro-enterostomy has had good results in some cases but in a large number the results are late and obtained apparently only after careful internal treatment. Moreover, the ulcer remains and therefore the danger of hæmorrhage, cicatricial contraction, the threatening peptic ulcer, and the danger of carcinomatous change. Resection is becoming more and more the method of choice. The simple excision of the ulcer is not at all to be recommended. Even in the most favorable cases only the ulcer is removed and not the tendency to ulcer formation. It is the province of gastric physiologists to explain the relationship between the vagus and sympathetic nerves and to find a method of operating upon these nerves which will cure the gastric ulcer disease. The transverse resection has the advantage that it sections the vagus-nerve fibers going to the pylorus. Perhaps it is for this reason that its results are so permanently favorable. When there are the least signs of neurosis or hysteria operation is contra-indicated. In cases of encapsulated perforations, operation should be delayed in order that local peritonitis may not be made general.

TIMM (Z).

Bruett, H.: The Surgical Treatment of Gastric Ulcer with Special Consideration of the End-Results; Also a Contribution to the Subject of Ulcer-Carcinoma (Die chirurgische Behandlung des Magengeschwüers unter besonderer Berücksichtigung der Fernresultate; zugleich ein Beitrag zur Frage des Ulcuscarcinoms). *Beitr. z. klin. Chir.*, 1921, cxxiii, 324.

The author considers the clinical symptoms of gastric ulcer, the technique of resection and gastro-enterostomy, the after-treatment following gastric operations, and the history of the treatment of gastric ulcer during the last thirty years. He discusses in detail the indications for operation, the different operative methods, and the value of the various procedures for the different types of gastric ulcer.

The importance of a thorough follow-up examination is emphasized. Consideration must be given not only to the patient's present state of health but also to his history since the operation. The X-ray examination of the stomach is of special value. Chemical examination of the stomach contents and the feces is necessary only when a new ulcer or a late complication is suspected.

In the choice of the operation both the duration of the results it usually yields and its mortality must be considered.

The newly formed uncomplicated gastric ulcer belongs to the internists. In cases of callous ulcer of the fundus of the stomach at a distance from the

pylorus the permanent effect of a gastro-enterostomy is very unsatisfactory. Of importance in such cases is the danger of subsequent hæmorrhage, perforation, and the formation of a peptic jejunal ulcer. The end-results of resection are very much better and therefore this procedure is to be preferred. Transverse resection has a considerably lower operative mortality than the Billroth II method and the modifications of the Billroth method and creates conditions more nearly resembling those of the normal stomach.

In cases of callous ulcer-tumors of the pylorus the danger of confusing the condition with carcinoma is greater than in cases of callous ulcer at a distance from the pylorus, but the late mortality due to gastric cancer is considerably higher than that due to callous ulcers at a distance from the pylorus. When the presence of a carcinoma is suspected any type of ulcer should be resected. For juxtapyloric ulcers and cicatricial stenoses of the pylorus the author always favors gastro-enterostomy, at times combining it with exclusion of the pylorus. The end-results, however, have shown that the satisfactory outcome of operations with a very low operative mortality may be rendered less favorable by subsequent complications (new ulcers, especially peptic ulcer of the jejunum). In cases of acute hæmorrhage due to ulcer operation should be performed only exceptionally except in cases of callous ulcer.

HELLER (Z).

Barrington-Ward, L. E.: Gastric Operations: A Note on One Hundred Consecutive Cases. *Lancet*, 1921, cci, 382.

A careful study of operative and postoperative results in a series of 100 consecutive cases operated on within a period of eighteen months convinces the author that the majority of gastric operations performed by capable surgeons are satisfactory and that the failures are due chiefly to the adoption of faulty operative procedures.

Gastro-enterostomy is a most valuable but much abused operation. Clear indications for it are: (1) gastric stasis due to organic obstruction of the stomach, and (2) ulcer of the stomach or duodenum which may be afforded rest by the operation. Gastro-enterostomy is absolutely contra-indicated in atonic dilated stomach and when an ulcer is situated so that it is not afforded rest by the operation (for example, in the cardiac end of stomach). For the latter type of case the best available treatment is simple excision by means of the knife or by Balfour's method with the cautery.

Partial gastrectomy is the most satisfactory method of dealing with gastric ulcer in the pyloric portion, with hour-glass stomach, and with hypertrophied and dilated stomach. The postoperative course is exceptionally easy. Ulcers prone to, or undergoing, malignant change are completely removed by this method and the cure of symptoms is more certain than when gastro-enterostomy is done.

Ulcers of the duodenum in the series of cases reviewed were apparently cured by gastro-enterostomy.

Poor results reported by some authors may be due to the performance of gastro-enterostomy in the absence of definite pathologic evidence of duodenal ulcer.

The end-results of gastrectomy for malignant disease were disappointing because of late recurrences, but earlier recourse to surgery and the more radical treatment of gastric ulcer by gastrectomy should improve the outlook in such cases.

R. W. NICHOLS, M.D.

Konjetzny, G. E.: Gastric Sarcoma (Das Magen-sarkom). *Ergebn. d. Chir. u. Orthop.*, 1921, xiv, 256.

This article consists of two parts, one dealing with the general pathology and pathological anatomy, and the other with the clinical aspects of gastric sarcoma.

According to various statistics, sarcomata constitute from 0.5 to 1.9 per cent of the malignant tumors of the stomach. Both sexes are equally affected, and the condition occurs most frequently during middle age. The etiology and histogenesis still remain almost entirely unexplained. A causal relationship between trauma and tumor formation has never been proved. The malignant change of a primary gastric myoma speaks against this etiology.

As a rule, gastric sarcoma arises from the submucosa, less often from the muscularis, and still less frequently from the subserosa. Primary sarcoma grows either in the form of a circumscribed, nodular, pedunculated, or broad-based growth, or as a flat infiltrating growth, partially or diffusely involving the stomach wall. Its site is usually the greater curvature and then, in order of frequency, the posterior wall, pylorus, lesser curvature, anterior wall, cardia, and fundus. Although true dilatation of the stomach does not often occur, the tendency toward shrinkage noted in cases of carcinoma is absent. Circular growths of sarcoma, however, often cause a narrowing.

The forms of gastric sarcoma may be classified as: (1) external, exogastric sarcoma; (2) pedunculated internal endogastric sarcoma; and (3) flat sarcoma invading the stomach wall. These various forms are described in detail and with good illustrations. A special type of sarcoma, lymphosarcoma, is described, and its relationship to aleukemic lymphomatosis is discussed. The differential diagnosis of pedunculated exogastric sarcoma from carcinoma is not at all difficult. The other forms, however, may be very easily confused with carcinoma. Sarcoma and carcinoma sometimes occur at the same time and very rarely there may be growths which contain both carcinomatous and sarcomatous tissue.

Whether the relation between primary and secondary gastric sarcoma is different than that between primary and secondary gastric carcinoma cannot be judged on the basis of the material on hand.

Unlike gastric carcinoma, sarcoma remains stationary for a considerable time. Metastasis is

also more uncommon but occurs in a considerable number of cases. Round-cell sarcoma is the most malignant of all varieties. Sarcoma does not have a definite plan of metastasis like gastric carcinoma. The statement that its metastases form along the blood stream appears to be untrue as regards gastric sarcoma as the secondary growths of the latter develop more frequently along the lymph channels. Histologically, there have been observed in the stomach round-cell sarcoma, lymphosarcoma, spindle-cell sarcoma, myosarcoma, and myxosarcoma. Round-cell sarcoma, including lymphosarcoma, is found in 40 per cent of cases and spindle-cell sarcoma and fibrosarcoma each in about 20 per cent. The course of gastric sarcoma varies greatly. Hesse found in 162 cases an average of twenty-two months with no great difference between round- and spindle-cell sarcoma. It may be assumed that some forms of gastric sarcoma are more malignant than gastric carcinoma.

One of the most important complications of gastric sarcoma is perforation, which apparently occurs more frequently than in cases of carcinoma. Moreover, severe hæmorrhages may occur when the tumor disintegrates. The clinical symptoms suggesting sarcoma are similar to those suggesting carcinoma. Vomiting occurs in a number of cases and there is blood in the vomitus and fæces. Chemical analysis may not show any change for a long time. Anacidity is not an early symptom and even in cases of flat, ulcerating, and infiltrating sarcoma, free acid may still be present. Tumor formation is the most important of the local symptoms.

According to the statistics of Hesse, a tumor was palpable in seventy-one of 179 cases. In general, it may be said that a tumor is more often palpable in cases of sarcoma than in cases of carcinoma.

The so-called Kundrat symptom, swelling of the follicles at the base of the tongue, is not conclusive but is suggestive of gastric sarcoma. Gastric tumor is almost always associated with an aleukæmic lymphomatosis of the stomach. The hæmoglobin content was decreased in all of the cases studied, often very much. The leucocytes were often slightly increased. There is no constant blood picture pathognomonic of gastric sarcoma. Except in cases of pedunculated exogastric sarcoma, it is practically impossible to make a differential diagnosis between sarcoma and carcinoma before operation. X-ray pictures give very little information regarding gastric sarcomata. In no case could a diagnosis be made from these findings. On the basis of experience to date it may be said that a differential diagnosis based on the roentgen examination may be expected only in cases of pedunculated exogastric sarcoma. The other forms cannot be differentiated with certainty from carcinoma or other gastric tumors by means of the X-ray. Radical removal by operation is the treatment of choice. An opinion as to the permanency of the results cannot be given as yet because the number of cases reported is not yet sufficient.

VON TAPPEINER (Z).

De Graaff, W. C., and Nolen, W.: Investigations Regarding Digestion and Absorption in the Small Intestine in Patients with Intestinal Fistula (Untersuchungen ueber die Digestion und die Resorption im Duenn darm bei Patienten mit Darmfistel). *Nederl. Maandsch. v. Geneesk.*, 1921, x, 113.

The authors report their studies in two cases. The first was that of a man 37 years of age who had amœbic dysentery, and the second that of a girl 25 years of age who had ulcerative colitis. In each case a separate ileum and cecal fistula was formed in order that the contents of the ileum might be examined separately.

The results of the thorough investigations demonstrated that a carbohydrate diet yields a chyme containing much water, and a nitrogenous diet, a chyme containing little water. The passage of the intestinal contents from the small to the large intestine takes place continuously, at night as well as during the day, but the quantity which passes over during the day is larger. The chyme requires from two to nine hours to reach the ileocecal valve. Its appearance and consistency are always the same. It is a thick yellow pulp with a slight odor which is never distinctly fecal. Its reaction is generally alkaline, but after the chief meal is acid.

Proteolysis reaches its maximum at night and its minimum at midday. The average proteolytic strength is 3,750 units; the amylolytic, 7,500. The contents of the small intestine contain no amino acids or coagulating albumin, and no glucose, except after a diet rich in carbohydrates. In the cases studied volatile fatty acids in combination with aromatic acids and biliary pigment were present. Phenols were found constantly in one case but never in the other. Indol was demonstrable neither in the chyme nor in the urine. Indol formation takes place in the large intestine. Its physiological importance has not been entirely established.

KOWITZ (Z).

Zoepffel, H.: A Retrocaecal Hernia Containing the Entire Small Bowel and Beginning Incarceration Caused by Perforating Appendicitis Cured by Operation (Ueber eine den gesamten Duenn darm einschliessende retrocoecale Hernie mit beginnender, durch eine begleitende perforative Appendicitis verursachte Einklemmung, durch Operation geheilt). *Deutsche Ztschr. f. Chir.*, 1921, clxv, 267.

The author operated upon an 18-year-old boy for peritonitis due to perforation of the appendix. A large sac containing the entire small bowel was found behind the cœcum. The upper part of the jejunum did not appear within the peritoneum at first but receded immediately behind it into the sac. The last end of the ileum made its appearance first at the small opening of the sac just behind the cœcum. Only the colon was within the peritoneum.

The sac was first split and then removed. The loops of small bowel were found to be collapsed, entirely empty, cyanotic, and nowhere adherent to

the sac. That part of the bowel lying in the opening of the sac was narrowed, and its wall was chronically inflamed.

In the author's opinion the cause of the hernia was a malformation. The patient never had any symptoms indicating hernia formation. The small bowel was in a state of strangulation caused by an inflammatory swelling in the region of the inflamed appendix which narrowed the neck of the hernial sac. The patient was discharged as cured.

In conclusion the author reviews fifteen similar cases reported in the literature. VOLLHARDT (Z).

Eggers, H.: Postoperative Intestinal Occlusion Following Lateral Entero-Anastomosis and Resection of the Small Intestine with Antiperistaltic Position of the Intestinal Loops. (Die chirurgische Behandlung des Magengeschwüers unter besonderer Berücksichtigung der Fernresultate; zugleich ein Beitrag zur Frage des Ulcuscarcinoms). *Beitr. z. klin. Chir.*, 1921, cxxiv, 235.

The author reports two cases of ileus which proved fatal following entero-anastomosis of the small intestine with antiperistaltic position of the intestinal loops. On the basis of these cases Eggers states that it is not a matter of no importance whether the intestinal loops are anastomosed in an anti-peristaltic position as some textbooks say (Kausch, Schmieden). The causes of the immovability due to this position must be sought in: (1) the overstretching of the afferent portion, by which the lumen of the efferent portion is compressed; (2) the too great difference between the lumina of the afferent and efferent portions, because of which too great a part of the intestinal serosa of the narrower efferent portion is taken up in the suture and the lumen is still more diminished; (3) the extent of the anastomotic opening; and (4) the weakening of the patient's general resistance. For these reasons the anti-peristaltic position should be avoided whenever possible, and when it is necessary on account of too great weakness of the patient, Kappeler's method of attaching the efferent loop for a considerable distance should be employed, although even in this case kinking may take place at the last suture.

It is better to choose an isoperistaltic position or end-to-side union. When the lumina show a great variation in width, the entero-anastomosis should be short, but not less than 3 cm., and spur formation should be avoided by wide joining of the serous surfaces of the narrower loop.

The mechanism of ileus is illustrated by schematic drawings. VORSCHUETZ (Z).

Wortmann, W.: Enterostomy in the Treatment of Intestinal Occlusion and Peritonitis (Die Enterostomie in der Behandlung des Darmverschlusses). *Med. Klin.*, 1921, xvii, 932.

Wortmann reviews the cases of intestinal occlusion treated in his clinic and recommends enterostomy for this condition. When the indications are definite this procedure gives excellent results, espe-

cially in occlusion due to kinking and cases of inflammatory mechanical ileus. Wortmann employs it primarily with removal of the occlusion and also secondarily if stasis persists after the removal of the obstruction. Not infrequently intestinal occlusion, especially that due to kinking, is relieved only by an enterostomy. This result is due to the fact that the valvular closure caused by the overfilling, distention, and kinking is released by the evacuation of the bowel.

Enterostomy gives good results also in carefully selected cases of peritonitis. A bowel which has been injured by peritonitis does not always recover at once spontaneously, in some cases functioning only after stimulation by irrigation. If possible, enterostomy should be performed in the lower part of the abdomen on the left side, under local anæsthesia, and in an upper loop of the ileum rather than in a lower loop or the cæcum because most kinkings and adhesions occur in the upper loops. The loop of bowel is drawn forward, and an incision is made between two clamps for the introduction of a No. 13 or 14 Nelaton catheter. With a few sutures the site is then inverted like a Kader-Witzel fistula, the bowel is replaced, and the site of the fistula is sutured to the peritoneum with four sutures. A small catheter is sufficient in all cases as it is necessary only to carry off gas and liquids and inanition is not to be feared. After the removal of the catheter following the return of normal peristalsis the fistula closes spontaneously in nearly all cases. If it does not, however, its closure may be effected by a slight operation.

VON TAPPEINER (Z).

Mokrowski, P. P.: Enteroliths (Zur Frage der Enterolithen). *Aerzt. Anz. d. Gouv-Gesundheitsamts u. d. Rigaschen Militærhosp.*, 1921, i, 21.

Intestinal stones are rare. Schwalbe reported one case among 100,000 surgical cases in the Catherine Hospital in Moscow. In the University Surgical Clinic in Moscow in the course of thirty-two years only two cases were observed among 7,680. The author observed three cases among 5,193 major operations in fourteen years in the hospital in Wologda. In two of these the operation was necessitated by the enteroliths, and in one the stone was found accidentally. In Russian literature only five cases are reported (Schwalbe, Chalafoff, Haudelin and Struve, Erichsen, Leshnew). The author's three cases were as follows:

CASE 1. The patient was a 38-year-old woman who, for several years, had had a hard movable tumor the size of the fist in the right side of the abdominal cavity. The growth gradually became larger. There were periodical attacks of obturation ileus and chronic obstipation. At operation two tumors which almost occluded the intestinal lumen were found in the small bowel. The proximal part of the intestine was hypertrophied. The tumors could not be moved downward. Mesenteric scars were found. Two stones were extracted by enterotomy. The mucosa was unchanged. The patient

recovered. The stones were dark brown and weighed 49.6 and 32.2 gm. They consisted of cellulose, magnesium, and calcium salts.

CASE 2. The patient was a 50-year-old woman who, for three years, had had a hard, nodular, rough, and movable tumor the size of the fist in the ileocæcal region which caused periodical obturation ileus and obstipation and œdema of the legs. At operation two tumors were found in the cæcum. The appendix was thickened and matted to the ileum which was hypertrophied. There was marked thickening of the wall of the cæcum. The tumors could not be pushed into the descending colon. The mesenteric glands were the size of hen's eggs. Appendectomy and cæcotomy were done. The intestinal wall was 3 cm. thick. The enteroliths weighed 51.7 and 12 gm. They were dark brown and had inorganic incrustations. The cross section showed islands of organic substance. Microchemical examination showed small amounts of cellulose and large amounts of inorganic salts (calcium phosphate, triple phosphates, calcium and magnesium salts). The mucous membrane was greatly ulcerated. The intestine was sutured with difficulty on account of the friability of its wall. The abdominal cavity was tamponed. Peritonitis developed on the eighth day and death occurred on the eleventh day. Postmortem examination showed peritonitis, local ileus, typhlitis, and colitis; a scar process about the ileocæcal valve; cæcal tuberculosis; cæcal stenosis; multiple tuberculous ulcers of the cæcum, descending colon, and ileum; and perforation of one of the cæcal ulcers from which the perforative peritonitis originated (*bacillus coli communis*). The intestinal suture had held together well. Microscopic examination showed cæcal tuberculosis and tuberculosis of the mesenteric glands.

In the presence of enteroliths ileus develops gradually, as hypertrophy of the proximal loop tends to force the stones through the intestine. Tiling of Russia has reported a case of complete intestinal obstruction due to a gall-stone the size of a walnut. In chronic ileus due to an enterolith the loops of intestine are practically never matted together. The chief part of the intestinal stone is composed of indigestible cellulose. Through inflammatory processes adhesions form between the intestinal mucous membrane and the cellulose masses. If these masses lodge in a pouch of intestinal wall the conditions are especially favorable for the formation of enteroliths. An analogue is the formation of fæcal stones in the appendix. In such cases also inflammation plays a part. Borodulin (Dissertation, Moscow, 1903) has shown that fæcal stones of the appendix are the result rather than the cause of appendicitis.

CASE 3. In the third case reported by the author operation was performed for chronic appendicitis. In the region of the cæcum was a diverticulum in which a foreign body about the size of a walnut was lodged. It was not possible to press the body out into the intestinal lumen. The appendix was 12 cm. long and adherent a slight distance from the diver-

ticulum. Appendectomy and cæcectomy were done and the fæcal stone extracted. The patient recovered.

The author considers enterotomy as the method of choice in dealing with intestinal stones.

HESSE (Z).

Halstead, A. E.: Ileocolic Intussusception protruding Through the Anus: Operation and Recovery. *Surg. Clin. N. Am.*, 1921, i, 1083.

The author reports a case of intussusception in a nursing infant of four months. At the time of operation, performed three hours after the first appearance of the symptoms, the ileum, which constituted the head of the intussusception, presented at the anus. The abdomen was opened, the invaginated small intestine manipulated toward the cæcum, the ileum pushed entirely out of the large intestine, and the distal end of the ileum just above the ileocæcal valve, which was bluish black and showed several areas of necrosis varying in size from 1 to 2 cm. in diameter, was covered with a small piece of omentum which had been cut off from its attachment. The ring of traumatized serosa and muscularis which marked the neck of the intussusception was then infolded by suturing together the uninjured serosa on each side of it, and the abdominal wall was closed in layers without drainage. The postoperative course was uneventful. Halstead discusses the incidence, types, symptoms, and treatment of this condition.

FREDERICK CHRISTOPHER, M.D.

DeQuervain, F., The Effect of the Removal of the Appendix upon the Function of the Intestine (De l'influence de l'ablation de l'appendice cæcal sur le fonctionnement de l'intestin). *Bruxelles méd.*, 1921, i, 252.

The physiological rôle of the appendix remains unknown; none of the numerous hypotheses offered have been proved. The question as to whether the removal of the appendix is an advantage or a disadvantage to the organism is still unanswered. To determine the influence of this operation upon the intestinal function DeQuervain studied 500 cases. The time which had elapsed since the operation varied from three months to three years. The results of the study were as follows:

In 60 per cent of the cases there was no alteration in the intestinal function; in 29 per cent, evacuation of the bowels became better; and in 11 per cent evacuation became more difficult. The removal of the appendix therefore appears to have overcome constipation three times more frequently than it increased it, a fact which does not argue strongly in favor of a secretory action of the appendix stimulating peristalsis.

DeQuervain believes all operations involving the peritoneum are followed by analogous reflex phenomena. He investigated this subject in 200 cases of operation for inguinal hernia. The results revealed that the function of the intestine remained unchanged in 58 per cent of the cases, was accelerated

in 33.5 per cent, and was slowed in 8 per cent. There is therefore a striking agreement between these findings and those following appendectomy.

DeQuervain believes that hernia, as well as chronic appendicitis, is capable of upsetting the visceral reflexes sometimes in the direction of acceleration and at other times in the direction of an arrest of peristalsis. The final result of the removal of the cause—appendicitis or hernia—is essentially the same.

The relation of these observations to the operative indications in cases of appendicitis appears to be evident. We are justified in proposing early operation pending an attack and in the interval between attacks without considering the suppression of the function of the appendix. We know that the mortality of appendicitis treated non-operatively is about 8 per cent, while that following operation performed during the first day is 0.7 per cent. It is to be presumed that a patient would not prefer to take the risk of an 8 per cent mortality rate to escape the 9 per cent risk of postoperative constipation.

LOYAL E. DAVIS, M.D.

Barbosa, J. M.: Cystic Pneumatosis of the Intestine (La pneumatosis quística del intestino). *Med. Ibera*, 1921, xv, 217.

Cystic pneumatosis of the intestine, which is rare and difficult to diagnose, is characterized by the appearance of numerous gaseous cysts in the coats and on the surface of the intestine. These cysts vary in size and do not contain any fluid. About 70 cases are reported in literature, the first by Duvernoy in 1754 and by Cloquet in 1820.

As a rule the condition is discovered accidentally at autopsy or operation and usually is associated with gastric ulcer, especially in the cicatricial and stenosing period.

Barbosa describes the case of a man aged 47 years who had suffered from gastralgia for ten years. Laparotomy revealed a callous ulcer of the pylorus and numerous gaseous cysts scattered over the mesocolon and the free border of the ileum. The detachment of these cysts caused extensive hæmorrhage. Death occurred soon after the operation from cardiac failure.

Callous ulcer of the stomach or pylorus was found in 59 per cent of the seventy cases reported in the literature, and pyloric stenosis in 72 per cent. In eight cases no concomitant lesion of the intestine was discovered.

The affection may take different clinical forms. Barbosa distinguishes: (1) the pseudo-appendicitis type; (2) the peritoneal type; and (3) the type simulating acute or chronic intestinal obstruction. The clinical signs are a ballooning of the abdomen, a flaccid and easily depressed wall, a peculiar elasticity, tympanitic percussion, peritoneal crepitation, abdominal hypertranslucency, and acidity causing gas formation.

In the author's case the cysts were examined microscopically. Some of them were well vascular-

ized while others showed no vascularity. The contents consisted always of carbon dioxide, oxygen, hydrogen, or nitrogen gas. Sulphuretted hydrogen was never found. The walls of the cysts consisted of dense and sclerosed fibrous tissue.

In Letulle's opinion these gaseous cysts are due to an obliterating chronic lymphangitis. The author, however, has found nothing to support this theory.

W. A. BRENNAN.

Homans, J.: Torsion of the Cæcum and Ascending Colon. *Arch. Surg.*, 1921, iii, 395.

Torsion of the right side of the colon is one of the rare causes of intestinal obstruction.

The pathology of this accident rests on certain congenital maldevelopments plus a functional disturbance—rapid gas formation in the intestinal canal. For the development of a twist of the right colon the latter must have a mesentery. In addition, there may be a displacement: (1) of the cæcum toward the middle or left side of the abdomen, (2) of the cæcum upward toward the liver, or (3) of the both cæcum and the ascending colon. In some cases the cæcum may be fixed in its proper position and the ascending colon may form a downward hanging loop.

The studies of a number of men have demonstrated that retardation and churning of the contents of the bowel occur in the right colon for a considerable period; also that in the ascending colon and cæcum fermentative digestion takes place. Disturbances in the anatomy of this region may produce physiological changes bringing about unusual putrefaction and gas formation which may lead to acute distention, kinking, and volvulus.

Three types of twists may occur. The cæcum and colon may twist on their own axes; the ascending colon with a long mesentery may form a loop which rotates, or become locked about another intestinal coil; or the cæcum may twist or bend on itself.

Three cases are reported, the operative procedures employed in each being described.

I. E. BISHKOW, M.D.

Goldschmidt, W.: Operation for Carcinoma of the Large Intestine Complicated by Abscess Formation (Zur Operation der mit Abscessbildung komplizierten Dickdarmcarcinome). *Deutsche Ztschr. f. Chir.*, 1921, clxv, 419.

Heretofore carcinomata of the large intestine have been regarded as inoperable when they are not mobile in relation to their supporting structure or when regional or remote metastases are present. Those with abscess formation or fæcal phlegmons are least suitable for radical operation. In such cases heretofore the abscess was opened first and resection was delayed until after the cessation of the symptoms of inflammation.

The author reports three cases of his own. In the first two there were large tumors of the descending colon and the sigmoid flexure which had been pro-

duced by perforation of a carcinoma and abscess formation. In both cases the tumor was successfully mobilized and, without incision of the abscess, was placed in front of the abdominal cavity. In the first case a transverso-sigmoidostomy was performed in a second stage of the operation and the two intestinal fistulae were closed in a third stage. At the end of two years the patient was still entirely well. The second patient died from pneumonia and urosepsis one month after the operation.

In the third case there was an ileocæcal tumor the size of a fist. Primary resection resulted in a cure. The tumor was permeated by numerous abscess cavities. Histologic examination revealed tuberculosis.

On the basis of his experience the author concludes that the indications for the radical removal of tumors of the large intestine must be extended.

WINIWARTER (Z).

Haeggstroem, P.: A Case of Stake-Injury (Noch ein Fall von Pfählungsverletzung). *Uppsala Laekaref. Föerh.*, 1921, n.s. xxvi, 215.

A 12-year-old boy fell from a hay-stack and alighted in a sitting posture on a stake. The stake penetrated the rectum to such an extent that he was unable to free himself. The stake was about 1 yd. long and from 1 to 1½ in. in diameter. At first the injury caused little disturbance. After three hours the patient was taken to the hospital in an automobile. The transportation caused him much pain. On admission to the hospital he showed signs of peritonitis. The urine was normal, showing that the bladder was intact. A laparotomy was done immediately. The rectum was perforated to the base of the Douglas fold and the lowest coil of the ileum was contused and its serosa torn. The opening in the rectum and the injured portions of the small intestine were sutured and the abdominal cavity was closed. Recovery resulted.

In the surgical section of the University Hospital in Upsala five cases of stake injuries were treated in the period from 1919 to 1921. Three of these injuries were extraperitoneal and two intraperitoneal. Recovery resulted in every instance. PORT (Z).

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Orth, O.: The Ideal Cholecystectomy (Zur Frage der idealen Cholezystektomie). *Zentralbl. f. Chir.*, 1921, xlviii, 1106.

The author is not in favor of the primary closure of the abdomen following cholecystectomy which is advocated by von Huberer, Ritter, and Schulz. He cites one case in which the ligature slipped from the cystic duct and caused an accumulation of bile under the peritoneum, the stump having been peritonized. The pulse dropped to 60 per minute due to the absorption of the bile.

The slipping of the ligature from the cystic duct is dependent upon the biliary pressure from the liver

and the physiological pressure due to the tonus of the choledochoduodenal sphincter. The former should be 200 mm., and the latter 675 mm. of water. Therefore, until the wound in the cystic duct is closed, which takes three days, it is safer to insert a drainage tube.

The author employs the extra-medial longitudinal incision.

VORSCHUETZ (Z).

Specht, O.: The Formation of a New Gall-Bladder Following Cholecystectomy (Ein Beitrag zur Frage ueber die Neubildung der Gallenblase nach Cystektomie). *Beitr. z. klin. Chir.*, 1921, cxxiii, 507.

Experiments on animals and material from the Giessen clinic (3,704 operations on the biliary tract) have shown no proof that the gall-bladder may be formed anew after cholecystectomy. Occasionally there may be a dilatation of the cystic duct but this cannot be regarded as a substitute for the gall-bladder. This widening of the cystic duct, which occurs regularly in dogs, is very rare in man and when it does develop is rarely regarded as a cause of the difficulties necessitating the second laparotomy. The formation of a stone in this stump of the cystic duct is possible, but very unusual.

Kehr's statement that after the removal of the gall-bladder the cystic duct tends to form a gall-bladder with true stones has not been proved. Therefore his suggestion that the cystic duct should

be removed close to the common duct in every cholecystectomy to prevent the formation of a new gall-bladder is of no value. In difficult cases it is often best not to isolate the cystic duct. In ninety-nine cases in which such isolation was not effected no regeneration of the gall-bladder was observed.

KONJETZNY (Z).

Kanavel, A. B.: Splenectomy under Local Anæsthesia in a Greatly Debilitated Patient. *Surg. Clin. N. Am.*, 1921, i, 965.

Kanavel describes in detail his application of Labat's technique to prevent excessive pain due to manipulation, particularly pulling, of the viscera during laparotomy under local anæsthesia. A needle was passed obliquely inward on each side of the body of the first lumbar vertebra so that it penetrated the retroperitoneal tissues in the region of the celiac plexus. Thirty-five cubic centimeters of a ½ per cent novocaine solution were used on each side. After ten to fifteen minutes the abdomen was opened under local anæsthesia, the spleen was dislocated from the abdomen, two forceps were placed on the pancreatic and gastric side and one on the splenic side, the splenic artery being grasped separately, and the spleen was removed. The tugging and pulling on the viscera necessitated by such manipulation caused no pain. The spleen weighed 1,500 gm.

J. D. ELLIS, M.D.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES TENDONS, ETC.

Rosenow, E. C., and Ashby, W.: Focal Infection and Elective Localization in the Etiology of Myositis. *Arch. Int. Med.*, 1921, xxviii, 274.

The results of an investigation of twenty-eight cases of myositis at the Mayo Clinic and the findings in animals given injections of cultures made from material obtained from these cases are reported. The technique employed is that devised by the author and used in previous experiments regarding elective localization. In twenty-five of the cases, foci of infection, such as tonsils and teeth, were removed, and in twenty-two of these this was followed by very definite improvement or recovery. In all but one case elective localization of bacteria from foci or excised muscle occurred following intravenous injection into animals. Of these twenty-seven positive cases, the streptococcus was found to have an elective affinity for muscle in twenty-four, the streptococcus and staphylococcus in two, and the staphylococcus alone in one.

Culturally the streptococcus showed two types of colonies on blood-agar plates: one, a small colony surrounded by a hazy zone of hæmolysis, and the other a slightly larger, dry colony surrounded by a greenish zone. The muscle lesions produced in rabbits were caused by the slightly hæmolyzing strep-

tococcus in ten instances and by the green-producing type in ten instances, while in four cases both were present. The staphylococcus alone was responsible for but one case.

The cases of myositis investigated fell into three distinct clinical groups: (1) cases of acute and chronic myositis without other demonstrable lesions at the time of study, (2) cases with predominating symptoms of myositis in which periartthritis and arthritis were present, and (3) cases in which myositis was the chief factor, but there was associated neuritis or perineuritis.

Cultures from these three groups were injected intravenously into rabbits and the resulting lesions tabulated. In the first group were ninety animals, in the second sixty-one, and in the third fifty-one. Of the first group of animals, 88 per cent had muscle lesions, 16 per cent were found to have turbid joint fluid, and only 1 per cent had lesions in the nerves. In the second group the corresponding figures were 79 per cent, 28 per cent, and 0 per cent, while in the third group they were 67 per cent, 8 per cent, and 35 per cent. These results paralleled very closely the findings in the clinical cases, not only with regard to muscular lesions, but also with regard to the incidence of lesions in the joints in the arthritis group and in the nerves in the neuritis group.

The relation between the results of this group of experiments and the results obtained in other ex-

periments on elective localization is striking. There were numerous instances of very marked electivity brought out in this series, some of the most specific instances being present in animals which had been given injections of salt solution suspensions of the small numbers of bacteria obtained in pus expressed from tonsils.

A detailed report of clinical and experimental observations on the more important cases is given and the microscopic findings in the affected muscles are described. The lesions were usually found between muscle fibers and, in the earlier lesions, extravasation of red blood cells, dilation of adjacent capillaries, and œdema, with loss of striation of the muscle fiber as the swelling increased were the chief characteristics. Later, in larger lesions, fragmentation and necrosis of the muscle fibers occurred as leucocytic and other cells became numerous. Of eleven animals given injections of cultures of streptococci which had been killed with liquor formaldehydi, eight showed lesions of the muscles. This indicates that the property of localization is resident within the bacterial cell.

The authors state, "The conclusion, therefore, may be drawn that myositis, including even the mild, transient affections of muscles, is caused in the main by lodgment and growth of bacteria, usually streptococci, which have elective affinity for muscle tissue."

G. H. JACKSON, JR., M.D.

Jansen, M.: Dysostosis Cleido-Cranialis. *J. Orthop. Surg.*, 1921, iii, 468.

The author calls attention to the two principal symptoms to which dysostosis cleido-cranialis owes its name: (1) the enlargement of the fontanel, and (2) the pseudarthrosis or absence of parts or of all of the collar bone. He calls attention also to two other conditions which were present in seven cases: (1) shortening of the toes, and (2) bilateral flattening of the chest.

In Jansen's opinion the mechanical malformation and the symptoms of growth-stunting may be explained by the assumption that the fetus has been infolded in its long and transverse axes in the eighth week of fetal life. Direct amnion pressure forced its forehead against its chest and its shoulders forward. Compression of the flexible parts means arrest of blood supply. Arrest of blood supply may produce dwarf growth or death. The dwarf growth is proportional to the rapidity of growth (law of the vulnerability of fast-growing cell groups).

On the basis of these principles Jansen concludes that oligohydramnios may produce dysostosis cleido-cranialis in the eighth week.

F. W. CARRUTHERS, M.D.

Barrie, G.: Hæmorrhagic Osteomyelitis. *Am. J. Surg.*, 1921, xxxv, 253.

The term "hæmorrhagic osteomyelitis" was first used by the author ten years ago to describe a bone lesion which previously had been considered a

malignant neoplastic process. He believes that the designations "giant-cell sarcoma" and "giant-cell tumor" are inadequate, inexact, confusing, and misleading. The giant cell encountered in this lesion is a scavenger or a foreign-body type of cell and has no tumor formation properties. Its function appears to be that of removing sterile débris.

It is definitely stated that a preliminary diagnosis is impossible without the use of the X-ray. It should be emphasized also that an area of osteolysis shown by the X-ray may mean one of many other gross pathologic lesions. It may be necessary to combine the clinical and X-ray pictures with the gross and microscopic studies to make a positive diagnosis of hæmorrhagic osteomyelitis.

The condition is most frequent in the first and second decades of life. Months or years may have elapsed in the development of the bone to a large size. There is usually a history of injury which may have been remote. Pain is not constant. There is enlargement locally. Sensitiveness to pressure is present and there is some limitation of motion in the nearest joint. If the lesion is in the lower extremity the subject limps. The roentgenogram shows a clear-cut round or oval area of osteolysis. The periosteum is usually intact.

The gross specimen shows vascular granulation tissue interspersed with areas of fibrosis or degenerated hyaline masses.

Microscopic examination shows a heterogeneous cellular picture of fibroblasts, scavenger giant cells, endothelial and polynuclear leucocytes, lymphocytes, eosinophiles, and red blood cells.

The treatment recommended is curettage, swabbing with tincture of iodine, and, if the lesion is larger than a pigeon's egg, filling with bone shavings, chips, or a bone graft. The author has had no recurrences in ten years.

PHILIP LEWIN, M.D.

Jones, S. F.: Sclerosing Non-Suppurative Osteomyelitis as Described by Garré; Report of a Case, with the Roentgenographic and Pathologic Findings and a Review of Literature. *J. Am. M. Ass.*, 1921, lxxvii, 986.

The sclerosing types of osteomyelitis are those in which there is merely an enlargement and a thickening of the bone without suppuration or fistula formation.

In the majority of cases the onset of the disease is acute and is accompanied by a high fever, swelling of the affected limb, pain at the site of the bone lesion, and considerable infiltration of the soft parts. The skin over the affected bone, however, is not reddened and there is no formation of pus. With the subsidence of the temperature, the swelling of the soft parts disappears, only the osseous enlargement remaining.

Mauclair refers to the statement of Kocher that a considerable number of cases of bone sarcoma which have been cured by amputation were merely cases of sclerosing non-suppurative osteomyelitis. The latter type of bone involvement may be

confused also with the syphilitic and sarcomatous types and the rare type of solid osteitis fibrosa encountered in the long bones.

The syphilitic osteitis and periosteitis result in the fusiform enlargement of the shaft of the bone and lead to a diffuse hyperostosis closely resembling the chronic stages of non-suppurative osteomyelitis. Osteal night pains are common to both bone diseases.

In cases of sclerosing non-suppurating osteomyelitis the absence of other syphilitic manifestations, the gradual subsidence of the pain, and a negative blood and spinal-fluid Wassermann reaction should establish the diagnosis.

In bone sarcoma the problem is even more difficult, for frequently there is a history of trauma to the affected area. The initial rise of temperature, the absence of glandular enlargement, the infiltration of the soft parts, which is present early in the sclerosing type of osteomyelitis, and the absence of cachexia and rapid loss of weight are important points in differentiating the osteomyelitis under discussion from malignant bone disease. A careful roentgenographic and pathologic examination should be made in every case.

In osteitis fibrosa with or without the formation of cysts the predominating clinical symptom is that of a spontaneous fracture, and the swelling and pain are not symptoms of which the patient complains. The temperature is usually normal and the pathologic process is so insidious in its onset that only the occurrence of a slight trauma resulting in fracture of the affected bone causes the patient to seek surgical advice.

Trauma cannot be considered as an etiological factor. Most observers believe that the disease is due probably to an inflammatory process in the long bones. We must depend upon the pathologic laboratory and the roentgen-ray examination to aid in differentiating these unusual bone conditions.

A detailed case history is given.

L. C. DONNELLY, M.D.

Cohn, I.: Observations Based on a Study of Injuries to the Elbow. *Arch. Surg.*, 1921, iii, 357.

The author describes certain lines drawn upon the roentgenogram of the elbow joint whereby the normal contour of the joint or a deviation from the normal may be determined. The position of the capitellum is most important. With the elbow flexed to a right angle, the lateral view shows the capitellum occupying the sigmoid cavity. In early life a wide separation appears between the articular surface of the capitellum and the great sigmoid cavity which is entirely eliminated in growth.

A plane bisecting the shaft of the humerus prior to about the ninth year passes behind the posterior border of the capitellum. After this period approximately two-thirds of the lower epiphysis is anterior to it.

The plane of the anterior limit of the shaft of the humerus shows at least one-half of the capitellum anterior to it. A plane at right angles to the

base of the capitellum and bisecting it intersects the plane, bisecting the long axis of the shaft at an angle of about 130 degrees. With the forearm extended and supinated, a plane bisecting the humerus is intersected by a plane bisecting the ulna at an angle of approximately 170 degrees.

After the ninth year the olecranon occupies the entire olecranon fossa and overlaps the capitellum, while in early life the capitellum is not overlapped by the olecranon.

A small group of patients treated by the author had deformity and limitation of motion and all of them presented themselves for treatment several hours after the injury with swelling around the site of fracture which made it impossible to maintain the hyperflexed position.

A number of cases have been reported as having epiphyseal separation when careful study showed the joints to be normal.

The roentgen ray is of inestimable value when properly interpreted. The roentgenogram must not be depended upon to show a fracture within an epiphysis in young children before the epiphysis has been sufficiently ossified. A disturbance of the relationship of the planes mentioned by the author would enable the roentgenologist to state that there will be a disturbance of function and deformity unless the condition is corrected. Delay in reducing the deformity increases the difficulty of treatment because of the swelling. External rotators should be developed in cases with supracondyloid fractures of the humerus to prevent the carrying of the arm in internal rotation and consequent cubitus varus deformity.

In the correct diagnosis of injuries to the elbow the history, including both subjective and objective phenomena, is important. On inspection, the position — semiflexion, and diminished or lost carrying angle — should be determined. Lateral mobility may be increased by a tear of the lateral ligaments and is exaggerated if one of the condyles is fractured in addition. It is further increased by contraction of the attached group of muscles which are unopposed by the group torn away from the shaft.

Palpation always reveals pain at the site of fracture. Therefore examination should be continued under anæsthesia. Supracondyloid fractures should be reduced in hyperflexion because the triceps acts as a natural splint and the relaxed flexors have a tendency to bring the distal fragment into the bend of the elbow. In fractures of the internal condyle pronation is desirable with hyperflexion to prevent contracture of the supinators attached to the external condyle, and consequently does not diminish the carrying angle.

In fractures of the external condyle hyperflexion and supination are required in order to relax the pronators of the forearm which are attached to the external condyle.

A conical bag with the apex down supported by tapes tied around the neck is found useful to prevent the bandage from slipping.

After the tenth day flexion should be diminished at short intervals, and contrast baths, massage, and passive motion limited by pain should be begun. Plaster molded splints should be used and the arm should be held in external rotation. The dressing should be closely observed for the first twenty-four hours to prevent Volkmann's ischæmic contracture. The hand should be included to prevent secondary swelling. A roentgenogram should be taken and studied following reduction. Active and passive movements, massage, and resistive exercises should be employed after the fourth week.

RUDOLPH S. REICH, M.D.

FRACTURES AND DISLOCATIONS

Scudder, C. L.: Certain Problems Concerning Fractures of Bones. *Ann. Surg.*, 1921, lxxiv, 280.

With regard to fractures of bone there are certain problems which are not altogether settled, viz.: (1) the process of repair; (2) the causes of non-union; (3) the treatment of ununited fractures; (4) the repair of pathologic fractures; (5) the proper handling of comminuted fractures; and (6) the treatment of malunited fractures.

The author states that the older methods (rigid bone methods) of treating fractures by "setting" the fractured bone, by the use of splints and plaster of Paris to fix the "set bones," by immobilization of the joints above the fracture, by keeping tightly constricting and compressing splints and bandages on the fractured limb for weeks, the soft parts, the skin, nerves, vessels, and muscles all being left without care, are abominable and should not be tolerated today. Good results obtained under this ancient régime were obtained in spite of the treatment rather than because of it.

The following methods have proved valuable:

1. Extension and counter-extension. These require careful supervision and a nice discrimination in their application. They permit supported active movement of the joints adjacent to the fractured bone at an early date and continuously throughout the treatment.
2. Direct bony traction, which brings the forces of traction and counter-traction into action most effectively and accurately.
3. The direct grasp of bone without penetration for the application of traction.
4. The direct traction method of Parkhill and Freeman in America.
5. The direct operative treatment advocated and popularized by Sir Arbuthnot Lane.
6. The suspension of fractures which helps to eliminate muscular contraction and renders traction forces more effective.
7. The use of the roentgen ray.

The treatment of fractures may be greatly improved by:

1. An organized fracture service in each of the large hospitals in the country:

a. Special wards should be used for the treatment of fracture cases. It is impossible to care adequately for these cases when they are scattered throughout a hospital as under such conditions the responsibility is divided among many persons, there is no concentrated interest, and too much work is delegated to ignorant subordinates. The general service would be more free if separated from the fracture cases.

b. A special personnel should be in charge of these fracture wards. The chief of this service should be a surgeon of broad general experience who is actively interested in molding the policy of the fracture division. He alone should be finally responsible for the results. Serving with, and under, this chief should be the necessary assisting surgeons, resident house surgeons, and nursing force. The service of this staff should be continuous throughout the year.

c. This continuous control should include the out-patient service where the ambulatory cases are received and treated. Each day of the week there should be an out-patient clinic for fractures which the fracture service controls and with which it is in intimate touch. The policies of the out-patient and house fracture service should be identical and under the control of the chief of the service. Cases of fracture should be followed until the maximum functional results are obtained and the wage earner is on his feet and re-established.

d. Insofar as fractures are concerned, the emergency ward for accident service should likewise be under the direct care of the chief of the fracture service. A fracture received in the accident ward should be regarded as an emergency case requiring the immediate attention of those directly responsible for the ultimate result. A fracture should be considered as much an emergency as a case of perforated gastric ulcer. The initial treatment is vital to a satisfactory outcome in both instances.

e. An operating plant in connection with the house service is essential. The operative fractures must be kept apart from septic operations. Separate instruments must be employed.

f. A lecture room with easy access to the wards is necessary.

2. Adequate instruction of the undergraduate medical student.

3. The institution of smaller hospital units in towns adjacent to, and remote from, large centers.

4. Graduate instruction of the general practitioner interested in fractures.

5. Formal instruction of medical students intending to become specialists in this branch of surgery.

6. Encouragement of specialization within general surgery of the surgery of fractures. Accident surgery today covers a complicated and varied field.

7. The organization of a clinical surgical fracture society meeting once a year for the sole discussion of fracture problems.

L. C. DONNELLY, M.D.

Thomas, T. T.: Fixation by a Wood Screw Without Arthrotomy in Certain Fractures of the Neck of the Femur. *Am. J. Surg.*, 1921, xxxv, 292.

Certain neglected fractures of the neck of the femur are treated by the author by means of the Whitman abduction method followed by fixation by means of a wood screw without arthrotomy. Under anæsthesia the thigh is abducted and a plaster spica extending from the lower thorax to, and including, the foot is applied, and an opening 6 by 8 in., with its center over the great trochanter, is cut in the cast. A few days later the patient is again etherized and an incision about $3\frac{1}{2}$ in. long is made over the most prominent portion of the great trochanter in the long axis of the limb, to expose the anterior and posterior margins of the great trochanter.

With the X-ray as a guide, a screw is driven through the trochanter and neck into the detached head of the femur. The necessary length is determined by the roentgenogram, but as the shadow is larger than the object, the screw should be $\frac{1}{2}$ to $\frac{3}{4}$ in. shorter than the distance from the external surface of the trochanter to the surface of the middle of the head in the X-ray plate. This obviates the possibility of driving the screw through the head and into the acetabulum. The wound is then wiped out with a little dichloramine-T and completely closed, dressings are applied, and the opening of the cast is reinforced by means of several plaster-of-Paris bandages.

Because of the small exposure there is practically no chance of infection. If the patient is young enough he may be permitted to get about on crutches with the cast on at the end of four or five weeks following the introduction of the screw. The latter will prevent any displacement of the fragments and the weight-bearing will favor the more rapid and certain development of bony union.

The author presents the reports of four cases in which he employed the method described. He states that to date the results have been good but not sufficient time has elapsed to warrant final judgment as to the outcome.

RUDOLPH S. REICH, M.D.

Kurlander, J. J.: Fracture of the Spine of the Tibia. *J. Am. M. Ass.*, 1921, lxxvii, 855.

The author states that fracture of the spine of the tibia is rare and may or may not be associated with injury to the crucial ligaments. In this connection he describes the anatomy and physiological action of the crucial ligaments and the knee joint.

A résumé of the literature regarding fracture of the tibial spine is given.

Kurlander believes that practically all fractures of the tibial spine are produced indirectly by powerful traction on the crucial ligaments as the tibial spine is practically inaccessible to direct violence. Three cases are reported:

CASE 1. The patient was a man 19 years of age. In a fall his leg was suddenly flexed under him and he struck his knee on the curb stone. Swelling,

severe pain, and loss of function followed almost immediately and persisted for three weeks, at the end of which time he was seen by the author. The X-ray disclosed a complete transverse fracture of the tibial spine. A plaster cast was applied with the leg in complete extension. The cast was removed in six weeks and active and passive motion then instituted. Recovery was complete.

CASE 2. The patient was a woman 50 years of age who fell with the knee strongly flexed and abducted. Examination revealed rupture of the internal lateral ligament and swelling, pain, tenderness, and loss of function. The X-ray disclosed avulsion of a spine of the tibia. The patient was seen four months after the injury.

CASE 3. The X-ray showed only a crack through the tibial spine. The fragment was not removed from its bed. The symptoms were thought to be due to a displaced external semilunar cartilage.

The diagnosis may be made positively only by means of the X-ray. The most presumptive signs are blocking and locking of the knee.

The treatment should be conservative. Under anæsthesia the knee should be manipulated until full extension has been obtained and then immobilized in extension in a plaster cast for eight to ten weeks. After the removal of the cast massage and passive motion should be instituted.

When chronic disability due to blocking of extension persists it is best to remove the offending fragment of bone through a patellar incision. The post-patellar pad of fat should be removed in order that a good view may be obtained. The obstruction to complete extension should then be removed and the incision closed. Complete extension should be maintained in a plaster cast for six weeks and massage and motion then begun.

FRANK G. MURPHY, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Gallie, W. E.: The Implantation of Tendons. *Am. J. Surg.*, 1921, xxxv, 268.

Gallie states that wounds of tendons heal by ordinary scar tissue which is produced by the areolar membranes on the surfaces and the connective tissue trabeculae which separate the bundles of fibers. This scar tissue when subjected to strain is apt to stretch or break unless it is present in considerable amount.

To unite tendon to bone as in tendon fixation or transplantation it is necessary to place the tendon in close contact with the bone over a considerable area in order that the scar tissue may be strong enough to withstand the anticipated strain. It is necessary also to remove all the areolar membranes from the surface and it is best to split the tendon in order that the raw surface may come in contact with the bone.

To unite tendon to tendon the raw surfaces must be placed in contact over a sufficient area to insure

the required strength in the scar. This may be done conveniently by braiding or splicing one tendon into the other.

PHILIP LEWIN, M.D.

McWilliams, C. A.: The Values of the Various Methods of Bone Grafting Judged by 1,390 Reported Cases. *Ann. Surg.*, 1921, lxxiv, 286.

The author has analyzed all bone graftings reported in the literature and the replies obtained from a questionnaire. He considers a method as successful only when the graft produced a satisfactory amount of new bone.

Connective tissue seems to be essential in the formation of bone. Osteoblasts are indistinguishable from fibroblasts. The first occurrence in bone formation is the gathering of fibroblasts around a blood vessel. In this new fibrous tissue calcium is deposited by some unknown influence which goes on to the formation of bone. If calcium is deficient, fibrous union results. If there is too great mobility between the fragments, cartilage is formed but this may eventually become changed into bone. When there is no mobility, as when one bone is fractured and a parallel bone acts as a splint, there is no formation of cartilage. There are three requirements for successful bone grafting:

1. The graft must bridge a defect.
2. It must be of a size and type to reestablish the circulation.
3. It must act as a stimulus to osteogenesis.

The osteoperiosteal method of bone grafting is the method most often successful, and the intramedullary method is least often successful. The presence or absence of periosteum seems to be immaterial. Suppuration is apparently the most evident cause of failure. Insufficient, or even too brief, immobilization seems to be a very frequent cause of failure. Grafting should not be undertaken if a roentgenogram shows the ends of the bones to be markedly atrophied, a condition caused by deficiency in nutrition due to too tight or too long prolonged immobilization, suppuration, neurotrophic disturbances, or senility.

L. C. DONNELLY, M.D.

Haas, S. L.: Function in Relation to the Transplantation of Bone. *Arch. Surg.*, 1921, iii, 425.

In a series of experiments on dogs two metacarpals were resected, one being transplanted to the paraspinal muscles and the other denuded and replaced in its original position so as not to allow contact with other bone. The dogs were then allowed to walk.

The experiments lasted from forty-eight days to three years. The transplants were then removed and examined macroscopically, with the X-ray, and microscopically, the object being to determine the effect of function and lack of function.

In all the experiments the transplants which functioned showed very much less degeneration than those transplanted to the spinal muscles.

The author concludes that function undoubtedly exerts a definite influence on the viability of a trans-

planted bone; that free bone transplants degenerate less rapidly when functioning; and that transplants from old animals do not degenerate as rapidly as those from young animals.

ROBERT V. FUNSTEN, M.D.

Putti, V.: Arthroplasty. *J. Orthop. Surg.*, 1921, iii, 421.

This paper is based on an experience of 113 arthroplastic operations done by Putti in the past ten years: forty knees, thirty-eight elbows, seventeen hips, ten jaws, two ankles, two fingers, two toes, one wrist, and one shoulder.

Absolute indications for arthroplasty are sometimes encountered, e.g., ankylosis of the jaw, bilateral ankylosis of the hip, and ankylosis of the elbow in extension. We must admit, however, that it is seldom an absolutely necessary operation, and due consideration must be given to the patient's general health, age, temperament, and social state. It is not a suitable operation for children or for old people, the best age being between 20 and 50. The intelligent coöperation of the patient is a most important factor for if, in the postoperative treatment, this element is lacking, the operation may fail utterly because of his unwillingness to carry on mobilization. His financial condition must also be considered. If he cannot afford six to twelve weeks of after-treatment (depending on the joint involved), it may be best to advise against operation.

Post-traumatic arthritis is best adapted to arthroplasty. The results of treatment are usually more successful in the monarticular type than in the polyarticular type. The bony ankyloses give better results than the fibrous. One should not undertake the operation until the joint is entirely free from pain and swelling, and no trace of the primary disease remains. As a rule surgical intervention is delayed until a year after all sensitiveness has disappeared. Because of difficulty in determining the absence of latent infection, it is best not to operate on old tuberculous joints. The author has done this in only one case. Ankylosis due to progressive arthritis is also not a good risk for arthroplasty. In post-war wounds the operation should not be done unless all sinuses are closed, unless we are sure that no foreign bodies or sequestra are present, and unless no reaction follows massage, baking, and gymnastics. Even then we should wait for months or even years. It has been said the prolonged delay may preclude the return of muscle function but clinical experience shows that muscles inactive for years can regain their function to a great extent rapidly.

Regarding the special indications for each joint Putti states that the shoulder rarely requires arthroplasty because the immobility is compensated by scapular motion. The wrist requires operation only when it is rigid in flexion, but unilateral ankylosis of the hip is a deformity to which the patient cannot accustom himself. From the author's viewpoint, the very narrowly limited indications for

arthroplasty on the knee should be much widened. He states that, "since experience has shown the possibility of creating new joints which possess excellent functional qualities, which can support any work, and which, even after many years do not lose their power, I think that also the knee arthroplasty ought to be accepted with greater faith and should be executed more frequently. But at the same time that I make this statement, I feel it necessary to add that knee arthroplasty should be advised only when a precise indication is recognized, and it must be executed by operators who have acquired a notable skill in the constructive surgery of the joints."

In performing the operation the incision should allow complete exposure of the joint but should not sacrifice the tendons and muscles which move the part. For the elbow, the Kocher incision is best; for the hip, a curved transtrochanteric incision with its base proximal; for the knee, a U-shaped incision with its base downward; for the shoulder and wrist, a straight cut; and for the ankle, two lateral cuts. In the resection of the bone ends enough should be taken off to leave an interval of at least an inch between the new surfaces. It is necessary, of course, to interpose some sort of tissue, but there is lack of accord among surgeons regarding what it is best to use. The author has always employed free flaps from the fascia lata to cover both epiphyses completely, fixing them in place with catgut sutures.

After operation traction is applied for about a month to keep the joint surfaces separated. The first movements should begin after ten days and should be passive. They may be carried on by the patient himself by means of simple apparatus. Baking should be begun as soon as the wound is healed and continued for many months. When the lower limbs have been operated upon the patient should not walk until the thirtieth day. About a month after the operation a critical period of pain and stiffness usually sets in during which the patient and the surgeon may begin to doubt the results. This is due to a drying-up process and perhaps too much motion. The baking should then be discontinued for a while. After a few days the movements may be carefully resumed. The post-operative treatment is longest for the jaw and the knee.

The prognosis of arthroplasties as a whole is now more hopeful than it has been in past years. According to the statistics of the author's cases the best results are obtained in the elbow, the next best in the knee, the next best in the jaw and hip. The knee, which has been considered the least adapted to this operation, has been found in the light of recent advances to be the joint in which the results most satisfactory both to the patient and the surgeon can be obtained.

In judging the results, the amount of motion is not the only criterion. The new joint must be painless, must perform a reasonable percentage of the

functions of a normal joint, and must possess stability and fair resistance to hard work.

WILLIAM A. CLARK, M.D.

Campbell, W. C.: Arthroplasty of the Knee—Report of Cases. *J. Orthop. Surg.*, 1921, iii, 430.

The knee joint presents the most difficult problem in arthroplasty and unfortunately it is also the joint which is most frequently ankylosed. In solving this problem, animal experiments are of little or no value because we cannot simulate the ankylosed human knee nor can we obtain intelligent coöperation in the case of an animal.

Only a knee with ankylosis following acute infection is suitable for operation. Arthroplasty may be advised for all cases of fibrous ankylosis and for bony ankylosis in which the normal structure of the adjacent spongy bone has not been changed. When a medullary canal has been established through the destroyed joint or hypertrophied bone has replaced spongy bone the operation should not be attempted.

Through a U-shaped incision, base upward, the intercondylar notch is obliterated and the end of the femur made to conform to the antero-posterior convexity of one normal condyle. A concave surface is then shaped on the upper end of the tibia. If the knee has been in extension it will be necessary to lengthen the quadriceps tendon to obtain flexion; if it has been in flexion, the usual incision is made through the patellar tendon. The opposing new joint surfaces must be made to fit accurately to prevent lateral motion. "At completion there should be considerable laxity, with hyperextension possible to 40 or 50 degrees." In ten cases a pedunculated flap was interposed; in nine, Baer's chromicized pig's bladder was used; and in two, a piece of free fascia was inserted between the new joint surfaces.

Twenty cases are reported. In four of these, faulty material (Baer's membrane) caused failure, and in three, a pre-existing low-grade osteomyelitis prevented a good result. In nine cases definite voluntary motion was obtained; in four, slight motion; and in five, satisfactory function.

In all the successful cases action of the quadriceps was in evidence at the end of six or eight weeks. In one case an arthroplasty had been done before and when the joint was opened the second time ample space was found between the bones but was filled up with dense scar tissue which prevented motion.

WILLIAM A. CLARK, M.D.

Cook, A. G., and Stern, W. G.: Report of the Commission on Stabilizing Operations on the Foot. *J. Orthop. Surg.*, 1921, iii, 437.

The report of this Commission consists of two parts. The first by Cook, which is general in character, calls our attention to the most important defects in the foot caused by infantile paralysis and shows that the disability of the leg and foot are due, first, to the absence of muscle power which in time leads to disturbance of muscle balance, distortion of the bone, faulty weight-bearing, strain,

trauma, and the pain accompanying trauma, and second, to lack of normal development from insufficient normal use. From the consideration of these facts we come to the condition known as flail foot, the question as to the best method of obtaining stability of the foot in paralytic conditions, and the function and end-results two years after operation.

The author calls our attention to the fact that a stabilizing operation is indicated only when the loss of function of the foot depends upon instability of the joint or joints, and when, after faulty balance has been corrected, the muscles are still unable to control the movements of the joints.

From an analysis of some of the answers received to the questionnaires sent out by the Commission, it was learned that while three members of the Association preferred braces to any surgical operation, at least 95 per cent of the remainder preferred astragalectomy or some form of arthrodesis.

In comparing astragalectomy and the ordinary operations intended to produce arthrodesis it seemed to the Commission that there was no practical difference as far as the risk to life was concerned, but in order to come to some definite conclusion as to which operation was the best they visited and examined about 250 cases in the leading clinics of America. These cases were not selected but were taken at random and represented a fair cross section of the work.

Of the 250 patients examined by the Commission not over twenty had relapses such that the foot was unserviceable and could not be easily corrected and rendered serviceable by a secondary operation. In comparing astragalectomy with transverse horizontal section—the former known as the Whitman operation and the latter as the Davis operation—the Commission concluded that astragalectomy done after the method of Whitman is the operation of choice for the following reasons:

1. It is a clean-cut procedure and the operator can see what he is doing. The surrounding tissues are not bruised or mangled, and if the wound becomes infected the stitches can be easily removed and the whole cavity exposed and thoroughly drained.

2. Regardless of the chances or process of repair, it definitely and mechanically checks motion in three directions, adduction, abduction, and dorsal flexion, and lessens the range of plantar flexion.

3. When there is lateral motion at the ankle joint it is sometimes necessary to supplement a transverse horizontal section with an arthrodesis at the ankle joint, thus preventing all motion at the ankle joint. It is urged as an objection to astragalectomy that the removal of the astragalus shortens the leg. This is probably true, but the leg was too short before the operation and it does not appear to be appreciably shorter afterward. The shortening can be corrected by placing the foot in a position of moderate equinus and by inserting a lift in the sole of the shoe. The reconstructed foot is shapely, well formed, and serviceable. No

one unfamiliar with the operation of astragalectomy would ever suspect that the astragalus has been removed.

The second part of the report, which is presented by Stern, is the more technical and detailed part. By the term "stabilizing operation" is meant one which limits the untoward motion in one or more of the ankle joints in such a way that weight-bearing and walking in the physiological position will be restored and the deformity, when once overcome by corrective operation, will not tend to recur. Therefore simple tenotomies and tendon transplantations are not discussed, consideration being given only to the following standard operations:

1. Arthrodesis, either after the manner of Soule (astragalo-navicular) or Ryerson "triple arthrodesis" (astragalo-navicular, calcaneo-cuboid, calcaneo-astragalar), and the subastragalar arthrodesis of Davis.

2. Astragalectomy, with backward displacement of the foot after the method of Whitman and horizontal transverse tarsectomy with backward displacement of the foot after the method of Davis. It is generally agreed that for cases of lateral disability in which there are good calf muscles and the foot is more or less in equinus, arthrodesis is best and in some cases this may be combined with fasciotomy, corrective wedge resections, and appropriate tendon transplantation.

For the completely flail and dangle foot or lateral instability combined with calcaneus, the Commission found that the vast majority of operators prefer Whitman's astragalectomy. In connection with astragalectomy various forms of tendon transplantation or tenotomies for the correction or the avoidance of unfavorable positions may be necessary.

The consensus of opinion is that astragalectomy is not indicated in pes equinus or in ordinary lateral instability when there are good calf muscles. In comparing the Davis horizontal transverse section with that of the Whitman astragalectomy—the two operations of choice for the same deformity—the Commission recommends the Whitman operation on account of the fact that the Davis operation is not clearly surgical and the posterior displacement of the foot is very difficult to obtain.

The conclusions drawn are summarized briefly as follows:

1. Metal plates, wires, screws, nails, silk ligatures, and bone grafts are objectionable and unreliable.

2. Arthrodesis gives excellent results in lateral instability, especially where there are good calf muscles. The best results are to be found after the triple arthrodesis of Ryerson or the subastragalar arthrodesis of Davis. Arthrodesis of the ankle joint is rarely indicated.

3. Astragalectomy with backward displacement of the foot, when done after the method of Royal Whitman, for (1) calcaneus, calcaneo-valgus, etc.,

(2) for dangle foot, and (3) for lateral deformity, gives by far the best results. In some cases the results have been so perfect and the foot so symmetrical that it would have been difficult to tell that the foot had been operated on if the scar was not seen.

4. Horizontal transverse tarsectomy after the method of Davis gives, as a whole, results inferior to those obtained by the astragalectomy and is a more difficult, bloody, and less scientific operation.

5. The use of living ligaments after the method of Gallie, Putti, Peckham, and others has given isolated successes, but as a general rule has not been successful and is not held in universal esteem.

6. In a great many of the cases treated by fixation the fixation was done after the ordinary tendon transplantations had failed, and it would seem that the place for tendon transplantations is as an adjunct to a "stabilizing operation."

F. W. CARRUTHERS, M.D.

SURGERY OF THE SPINAL COLUMN AND CORD

Hill, R.: Laminectomy for Meningitis. *Surg., Gynec. & Obst.*, 1921, xxxiii, 288.

The author states in meningitis, especially that of streptococcic or staphylococcic origin, which is often fatal, death is due to two factors, increased tension and toxæmia. The advisability of performing a laminectomy with free spinal drainage in certain classes of cases is worthy of our consideration. A case of Downes is reported, in which meningitis followed fracture of the skull. Severe symptoms developed, including high blood pressure and marked leucocytosis. Occipital decompression above the foramen magnum was done and the dura over both sides of the cerebellum and cerebrum was incised. Fluid escaped, and the patient recovered. The author reports also two of his own cases:

CASE 1. The patient was a man 40 years of age. An operation was performed to remove a bullet from the ethmoid bone. The orbital plate of the ethmoid was found broken and some brain tissue came away with the fragments. One week later the patient became delirious, his temperature rose to 101 degrees, and at the end of two weeks he developed all the symptoms of meningitis. The spinal fluid was loaded with pus. Laminectomy was performed, the spinous process and lamina of the third and fourth lumbar vertebræ being removed. The dura was exposed for an inch and incised. Some of the symptoms persisted for a time but in one week the rigidity and high temperature had disappeared. In two weeks the mental symptoms disappeared. Entire recovery was slow but uneventful.

CASE 2. The patient was a man 27 years of age. Meningitis followed otitis media. The diagnosis was made on October 23. October 24, 3 oz. of spinal fluid were withdrawn. A laboratory report showed no organisms but a high polymorphonuclear cell count. October 28, the patient was in stupor with profound meningitis; his temperature was 101.4 degrees and his pulse 134. Laminectomy was performed in the region of the second and third lumbar vertebræ. When the dura was opened only a few drops of clear fluid escaped. A pointed instrument passed upward encountered dense adhesions and caused a gush of about 20 c.cm. of whitish pus. A rubber drain was inserted and the wound closed. The temperature dropped to 100 degrees but the patient was delirious and died two days later.

The author believes that operation is indicated in cases of streptococcic and staphylococcic meningitis. Recovery has followed repeated spinal puncture and it seems rational to assume that laminectomy should yield infinitely better results if it is done before the cerebrospinal channels are blocked by inflammatory products and adhesions.

FRANK G. MURPHY, M.D.

Pybus, F. C.: Spina Bifida. *Lancet*, 1921, cci, 599.

The author defines spina bifida as a congenital defect of the vertebræ, usually the posterior arches, which in most cases is associated with protrusion of the spinal contents. The defect occurs about once in 1,000 infants.

The different types of spina bifida met with clinically are best understood by a study of the development of the spinal cord from the neural groove which becomes the neural canal, the surrounding mesoblastic tissue which forms the spinal membranes, and the vertebræ which are first laid down in cartilage and later become ossified. A defect in any one of these stages may cause some type of spina bifida.

Spina bifida is occasionally a family defect, as illustrated by its occurrence in four children in one family cited by the author.

Spina bifida occulta, the mildest form, occurs when there is a defect in the vertebral arches without the protrusion of spinal elements. The defect is usually symptomless, is shown by a scarring or depression in the midline, and may be covered by a small hair field. Occasionally, a mild scoliosis develops at the site of the defect.

The meningocele is next in severity and least common. This type is characterized by the protrusion of membranes which contain cerebrospinal fluid. The tumor may be covered by normal thick skin or may be thin-walled, pedunculated, and sessile.

The meningo-myelocele is a protrusion of the membranes and contains some of the cord elements. It is the most common form and is larger, broader, and usually more translucent than the meningocele. The cord may open on the surface of the protrusion as a red ulcerated area.

The syringo-myelocele resembles the meningo-myelocele, but the central canal of the cord is dilated.

The myelocoele, the gravest defect of the series, is characterized by total lack of development of the posterior elements for a certain extent which leaves the central canal open to the surface. The condition is fatal early.

The diagnosis is made from the history and appearance of the swelling. The swelling has an impulse during coughing, and fluctuation can be obtained between the tumor and the anterior fontanel. A differential diagnosis must be made between a nœvus and a sacrococcygeal tumor.

Other congenital malformations, such as scoliosis, talipes equinovarus, and hydrocephalus, are often associated with spina bifida.

Operation should be limited to a few selected cases. Most meningoceles require surgical treatment, but there is no urgency. In myelocoele and meningo-myelocoele with a large raw area operation is of very doubtful value. The presence of hydrocephalus is a contra-indication to operation.

The first step in the operation consists in exposing and isolating the sac. In meningoceles the sac may then be amputated. In meningo-myelocoeles the sac is opened and the cord dissected free and replaced. The final step is the closure of the wound. If it is small, the membranes and fascia may be sutured; if it is large the paraspinal muscles and lumbar fascia may be utilized. Sometimes an osteoplastic repair may be necessary, but this has not been the case in the author's experience. For such repair the spinous processes above and below may be used or a bone graft after the method of Albee.

L. H. FOWLER, M.D.

Davis, G. G.: Fractures of Transverse Processes of the Lumbar Vertebrae. *Surg., Gynec. & Obst.*, 1921, xxxiii, 272.

The author states that fractures of the transverse processes of the lumbar vertebrae are not infrequent. Embryological development is important as an etiological factor. At birth the vertebra consists of three parts, the body and the halves of the arch. The ends of the transverse processes remain cartilaginous until after puberty, when a secondary center appears for each transverse process. These secondary centers fuse with the transverse process at about the twenty-fifth year of age. From this secondary center the transverse process of the first lumbar is sometimes developed as a separate part which may remain ununited.

The author describes the anatomy as this also is an etiological factor. The most important muscle, the quadratus lumborum, has part of its attachment on the apices of the transverse processes of the lumbar vertebrae. This is a strong muscle and when it acts while the thorax, spine, and pelvis are fixed it may fracture the transverse process of a lumbar vertebra by indirect violence. It is the author's opinion that practically all such fractures occur in this manner.

Ten cases are cited by Davis. In two, bilateral fractures occurred. In one, all five transverse

processes on the left side, and one transverse process on the right side were fractured. In another case the third and fourth processes on the right side and the fourth process on the left were fractured.

The symptoms of these injuries are definite. Pain is constant and well localized, and does not radiate. It is exaggerated by motion and disappears when the patient is completely relaxed in bed. Bending increases the pain. Muscular rigidity and a point of exquisite tenderness over the fracture are noted. The X-rays may show the fragment in good position but more often there is a considerable diastasis.

The diagnosis is made from the history of a fall or injury to the back resulting in an area of localized tenderness lateral to the median line of the spine. The X-ray will show the fracture.

The condition is often associated with osteoarthritis.

FRANK G. MURPHY, M.D.

Pearse, H. E.: Removal of Ventral Tumors of the Sacrum by the Posterior Route. *Surg., Gynec. & Obst.*, 1921, xxxiii, 164.

Ventral tumors of the sacrum are difficult to remove, frequently grow rapidly and encroach upon the bladder, bowel, and ureters. They are of varied structural formation macroscopically and microscopically. Their origin seems well established. Very probably they arise from embryonic remains of the Wolffian body. In the diagnosis they must be differentiated from all pelvic growths. Operative removal through the ventral route is futile because of the difficulty of approach and in controlling hæmorrhage. Operative removal through the perineal route is equally difficult because of the proximity of the ureters and the bowels.

The author states the best approach is through the sacrum. He gives the following rules of technique:

1. Place the patient on his face with the pelvis raised and the thighs flexed.

2. The incision should extend from just posterior to the anus upward in the midline above the coccyx, and then curve to the left and follow the left edge of the sacrum. It should be carried down to the bone, and the soft tissues should be dissected up to expose the edges of the sacrum and the sacro-sciatic ligament.

3. The sacrum should be divided below the third sacral nerves without opening its central canal. The attachment of the sacro-sciatic ligament to the coccyx should then be severed and the lower sacrum freed with a blunt dissector from all connections.

4. All bleeding should be arrested and the growth attacked according to its location, attachment, and adhesions. All Middledorff tumors should be attacked from this direction because: (1) they lie directly in front of the sacrum, (2) they can be removed without disturbing the rest of the viscera, (3) it is not necessary to open the peritoneum to reach the tumor, (4) the cautery

may be used freely without damage to other structures, (5) extensive tissue removal can be accomplished safely and quickly because the field is in plain sight, and (6) the blood and nerve supply can be seen and easily attended to.

Pathologically these tumors are of the nature of sarcoma and are malignant. They travel along the lines of the blood supply and their metastases are formed in muscle, fascia, or fatty tissue instead of the lymph nodes.

The author reports a case as follows:

The patient was a man 63 years of age who complained of constant pain in the lower bowel. Pain in the pelvis began two years ago. Treatment for lues gave no relief. A year before the patient was seen by the author he began to take sedatives for the relief of the pain. On physical examination a soft, cystic tumor was palpated in front of the coccyx and the lower sacrum. The diagnosis was ventral tumor of the sacrum. Radical removal was advised.

At operation the tumor was found to invade the gluteus maximus on each side of the coccyx. The sacrum was fractured across at the third sacral notch. The tumor was then found to be limited above by the peritoneum. It was rotated out of its position and removed. Shock was controlled. The tissues were approximated and drains inserted. There was no pain after the operation. Recovery was uneventful.

Four years later the patient returned with a tumor to the left of the scar. At the second operation this was found to involve the gluteal muscle and fascia, the old scar, and the surrounding fat and fascia. The pathologist reported it a hypernephroma. The patient recovered, but a year later showed a recurrence in the old scar about the

size of a hazelnut. This was removed at a third operation, as were also several nodular masses in the same area. The pathologist reported these also as hypernephromata. The patient was then treated with the X-ray periodically. One year later there was no recurrence of the tumor.

FRANK G. MURPHY, M.D.

Leighton, W. E.: Section of the Antero-Lateral Tract of the Cord for the Relief of Intractable Pain Due to Spinal Cord Lesions. *Surg., Gynec. & Obst.*, 1921, xxxiii, 246.

The author presents four cases in which he performed the operation of dividing the antero-lateral tract of the cord for the relief of persistent pain of organic origin. He concludes that this operation will give permanent relief if the lesion is below the level of the thorax. In cases of gastric crises the section must be made higher than the sixth thoracic segment. Leighton sees no reason why it should not be made as high as the second or third. He would add to the operation also section of the posterior nerve roots in the field as this would destroy sensory impulses which would reach to a higher level. The latter are not blocked in the section of the antero-lateral columns as this section includes only pain impulses which have crossed to the spinothalamic tract below this level.

In all cases of tabes a bilateral operation should be done. Spiller's suggestion that the incision of the cord might be carried forward so that it includes even the anterior or motor horn in the thoracic region would appear to be a good one as little harm could be produced by this procedure. The greatest danger lies in cutting too far posteriorly and thereby injuring the pyramidal tract.

FREDERICK CHRISTOPHER, M.D.

SURGERY OF THE NERVOUS SYSTEM

Lewis, D.: Peripheral Nerve Injuries in Civil Life. *Wisconsin M. J.*, 1921, xx, 169.

For the best results, peripheral nerve injuries should be given immediate or early attention. It is difficult to discover whether the injury is anatomical or physiological but too much time should not be wasted in efforts to determine whether or not function will return. Sutures done before the ninth month are the most successful.

In civil life nerve injuries are commonly caused by knives, glass, sharp metal, fractures, adhesions, and subcutaneous injuries. In fractures the nerve may be contused or divided by the sharp ends of bone at the time of the injury or may be included in the callus. The history of the time of onset of the paralysis will determine the cause.

In cases of compression by scar tissue function can often be restored quickly by freeing the nerve. One case is mentioned in which beginning return of function appeared within ten days after the operation although there had been complete paralysis

for six months. The paralysis may result from injury anywhere along the course of the nerve.

In subcutaneous injuries the nerve paralysis may be due to direct injury to the exposed part of the nerve or to some deeper portion. Three cases of injury of the external popliteal nerve are cited, in all of which there was trauma to the portion exposed over the head of the fibula. In one, the lesion was farther up in the popliteal space. The nerve had not been divided but had been pulled upon until the fibers had ruptured at some distance above the point where the force had been applied. In the second case the nerve had been severed subcutaneously. In the third, nothing could be found except delicate adhesions surrounding the nerve.

In clean-cut injuries of peripheral nerves it is necessary to remove only a small portion of the divided ends. The important point is to get the cut ends accurately approximated without axial rotation. Hæmorrhage from the cut nerve end should be controlled to avoid the formation of a hæma-

toma. A catgut suture may sometimes be necessary to approximate the cut ends. The perineurium should then be carefully closed with interrupted sutures of fine silk or catgut in order to avoid the growth of neuraxones out into surrounding tissue and the formation of a dense scar. Fine bee's-waxed silk is recommended.

Primary suture should be attempted in all cases of incised nerve injuries even if infection supervenes, as it will keep the cut ends from separating widely.

In cases of injury due to rapidly moving missiles the nerve changes are more marked so that it is often necessary to resect greater portions of the injured nerve before normal funiculi are found. Even when large sections of nerve are removed suture can usually be accomplished by mobilization of the nerve segments, displacement of the nerve, and suitable posture.

The advantage of primary suture is that no neuroma forms on the nerve. In cases of long delay a neuroma may be very large and necessitate wider resection.

The distal segment undergoes very little change, even after several years.

In secondary suture it is important to resect the scar tissue widely and to make accurate end-to-end anastomosis as in primary sutures. The dissection should be made along intermuscular septa so that the suture can be placed between healthy non-bleeding tissue. No Cargile membrane or other tissue should be placed around the nerve.

The only true index of the return of function is the return of motion.

The after-treatment is of great importance. The paralyzed muscles should not be overstretched nor yet allowed to atrophy. Rigid splinting is contra-indicated.

Trophic changes are often the direct result of trauma such as cigarette burns of the fingers and pressure on the toes and heels.

Suture of the musculospiral nerve gives the greatest number of successful results with return of function as early as five and a half or six months. After suture of the internal popliteal nerve, function may return as early as seven months, which is earlier than it returns following injuries of the external popliteal nerve.

Median-nerve suture gives good results. Following repair of the ulnar nerve the results are not often very good and motion is sometimes delayed for two years.

MARCUS H. HOBART, M.D.

Kreuz, L.: Intrapelvic Extraperitoneal Resection of the Obturator Nerve According to Selig's Method (Zur intrapelvinen extraperitonealen Resektion des Nervus obturatorius nach Selig). *Arch. f. orthop. u. Unfallschir.*, 1921, xix, 232.

On the basis of thirteen cases Kreuz recommends the intrapelvic extraperitoneal resection of the nervus obturatorius according to Selig's method as the treatment of choice in all cases of spastic adduction contraction of the lower extremities (hemiplegia, diplegia, true Little's disease). However, instead of the longitudinal incision along the border of the rectus or in the median line which is used by Selig he prefers Pfannenstiel's suprapubic incision. In the after-treatment the legs are kept somewhat spread apart for fourteen to eighteen days by means of a plaster cast. Active and passive abduction and adduction movements are then begun.

With regard to the permanency of the result Kreuz states that the time since the operation in the cases reviewed has been too brief to warrant an opinion.

RIEDER (Z).

MISCELLANEOUS

CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

Von Redwitz, E. F.: The Surgery of Influenza (Die Chirurgie der Grippe). *Ergebn d. Chir. u. Orthop.*, 1921, xiv, 57.

This article is a collective review with a bibliography of 1,117 references. In the introduction the nature, pathogenesis, etiology, symptomatology, and pathologic anatomy of influenza are discussed. The author then takes up the surgical complications. The surgery of influenza in the last two large epidemics was really the surgery of pyogenic infections. Almost all of the organs were involved with variable frequency and severity. The author states that as there was a general tendency to attribute to the influenza all pyogenic infections in persons who had had the disease, it is difficult to review these cases critically. It must be borne in mind also that at the time of the influenza epidemic pyogenic

bacteria were more numerous in our surroundings and the tendency to fever processes was therefore greater.

Most frequent were the complications following influenza of the respiratory tract. In this connection the author discusses in detail the treatment of influenzal empyema. Routine treatment, he states, is to be condemned. Close clinical observation and great care are essential for the rational care of this condition. In the opinion of most surgeons resection of the ribs should be delayed and only aspiration should be done until the pneumonic symptoms have disappeared and the heart has become stronger.

In the treatment of the pyogenic processes the epidemic suggested nothing new. The value of wound antisepsis according to the Carrel-Dakin method or by means of the quinine derivatives used by Morgenroth has not yet been established.

STAHL (Z).

SERA, VACCINES, AND FERMENTS

Eyre, J. W. H., and Marshall, C. H.: A Case of Trypanosomiasis Treated by Intrathecal Serum. *Brit. M. J.*, 1921, ii, 284.

A detailed report is given of the case of a patient with sleeping sickness who was treated by the injection of serum into the spinal canal. Infection was caused by a single bite of the tsetse fly, the incubation period probably having been two weeks in length. July 30, the patient suffered an attack of what he believed to be malaria which lasted for about five days, his temperature ranging from 102 to 103 degrees F. Quinine was given but was not effective. The last of several irregularly recurring attacks occurred August 24 and 25. At this time an examination of the blood showed the presence of *T. gambiense*.

When the patient was seen by Marshall, September 24, he was suffering from malaise, vomiting, pain in the back, and headache. There had been marked loss in weight. Examinations of the peripheral blood showed two to three trypanosomes to a field. An intravenous injection of 0.9 gm. of neokharsivan was given; half an hour later 20 c.cm. of blood were drawn and allowed to stand for twenty-four hours in a sterile container. At the end of that time a solid clot had formed. In this way 12 c.cm. of clear serum were obtained. The following day, after 15 c.cm. of cerebrospinal fluid had been removed by spinal puncture, the 12 c.cm. of serum were injected into the spinal canal. For two or three days the patient suffered a severe reaction, but following this convalescence was rapid.

Two weeks after the injection, examinations of the blood for trypanosomes were negative, although one of three animal inoculations was positive. Since the patient showed apparent recovery clinically, no further treatment was given. All subsequent blood examinations and animal inoculations with blood or cerebrospinal fluid were negative. No treatment was given other than the one injection of salvarsanized serum. The use of intrathecal serum was based partly on the theory that during treatment the blood forms definite antibodies (trypanolysins) as a result of the presence of the dead protoplasm of the trypanosomes.

Since infection with trypanosomes usually leads to an invasion of the central nervous system, Marshall and Eyre emphasize the necessity for routine intraspinal treatment as a curative measure; it should be used also as a prophylactic measure if such an invasion has not already taken place. They report that eight other patients who were given a single injection of serum were well at the end of one and one-half years. A careful investigation of this treatment in countries where this disease is common is urged. E. G. JACKSON, M.S.

BLOOD

Hartman, H. R.: Blood Changes in a Gastrectomized Patient Simulating Those in Pernicious Anaemia. *Am. J. M. Sc.*, 1921, clxii, 201.

The author reports a case of complete gastrectomy performed at the Mayo Clinic in which recur-

ring anæmia, weakness, and some of the pathologic changes seen in pernicious anæmia were noted.

The patient, a man aged 58 years, had been sick at intervals for fifteen or twenty years. His chief complaint was dull heavy pain in the epigastrium after meals, with distressing hunger before meals, relieved by food or drink. A diagnosis of peptic ulcer with possible malignancy was made because of the recent loss of 15 lb. in weight and a rapid decline in strength.

The blood pressure was normal. The findings of the blood examination were: hæmoglobin 80 per cent, red blood cells 5,520,000, white blood cells 8,200, and color index 0.7+. No differential count was made. Single analysis of the stomach contents one and one-half hours after a modified Ewald meal revealed a residue of 120 c.cm., no free hydrochloric acid, total acidity 4. The roentgenologist reported an indeterminate pyloric lesion.

Operation performed in August, 1917, revealed a movable carcinomatous ulcer on the posterior wall of the stomach extending to within 4 cm. of the œsophagus. A total gastrectomy was performed and about 1 cm. of the œsophagus removed; the end of the œsophagus was sutured to the lateral wall of the jejunum about 45 cm. from its origin. There was very little glandular involvement.

The patient returned to the Clinic ten months later, having lost 7 lb. He then complained of epigastric pain, heart-burn, and excessive salivation after meals. He was taking three fair-sized meals a day and milk between meals. As his condition appeared favorable, no laboratory tests were made.

Eleven months later he again returned, having grown progressively weaker. He complained of regurgitation after meals, which, if continued, resulted in regurgitation of bile. The blood picture was that of pernicious anæmia; the hæmoglobin ranged between 53 and 55 per cent; the red cell count was 2,000,000 and 2,280,000; the white cells varied between 2,200 and 7,600. The color index was constant at 1.2+. The red cells showed increased resistance. The Wassermann reaction and the neurologic examination were negative.

A year later the patient returned in a still weaker condition. The recrudescences and remissions of his anæmia were of shorter duration than is usual in pernicious anæmia, while his health suffered a general decline. The only foods which caused distress were meat and fresh bread. Examination of the eye grounds was negative. There was moderate œdema of the legs. The hæmoglobin was 48. The red cells numbered 1,420,500 to 1,880,000, and the white cells 4,000 to 4,700. The color index was 1.2 to 1.6+. Anisocytosis was moderate and poikilocytosis and polychromatophilia were slight. The Wassermann reaction was negative; coagulation and calcium times were eight minutes. There was increased resistance of the red cells.

The author suggests that this case, while of no significance in itself, might give some clue as to the etiology of pernicious anæmia. It suggests that the

absolute lack of gastric ferments might have something to do with an incomplete or abnormal food-splitting process, the results of which might themselves be hæmolytic or detrimental to the blood-forming organs. Pernicious anæmia is invariably associated with achylia.

A review of the literature showed only one case of complete gastrectomy which had been followed for any length of time. This patient, whose case was reported by Moynihan, was well for three years after the operation, when he began to show evidences of profound anæmia, became pale and breathless, and lost weight. He gradually failed and died in eight months. Necropsy showed no recurrence of malignancy; there was no dilatation of the jejunum at or near the site of the anastomosis. All the organs exhibited an extreme anæmia; the blood in the heart and great vessels was watery. The liver was pale and somewhat fatty. The spleen contained a large and very old infarct. The heart muscle was pale and flabby.

O. S. PROCTOR, M.D.

Mayo, W. J.: **Pernicious Anæmia, with Special Reference to the Spleen and the Large Intestine.** *Ann. Surg.*, 1921, lxxiv, 355.

Pernicious anæmia is characterized by progressive degeneration of the red blood, permanent change in the method of production of blood, marked changes in the spinal cord, achlorhydria, and glossitis. The relation of the cord changes, achlorhydria, and glossitis to the anæmia has not been determined. The etiology of pernicious anæmia is unknown; the early symptoms are indefinite and by the time a diagnosis can be established the condition is incurable.

The relation of the spleen to the formation of the blood led the earliest observers of pernicious anæmia to suspect that the spleen was associated with the disease. It remained for Eppinger to suggest that the removal of the spleen might cure, and early reports give testimony of temporary relief after splenectomy sufficient to justify a fair trial of the operation. In the cases observed in the Mayo Clinic there was a marked gain in weight, an improvement in hæmoglobin on an average from 36 to 72 per cent, and an increase in the red cell count on the average from less than 2,000,000 to more than 4,000,000.

Previous to November 1, 1917, fifty splenectomies were performed in the Mayo Clinic for definitely established pernicious anæmia. The operation was then almost entirely discontinued for this condition for three and one-half years as there was not sufficient evidence that it would effect a cure and at that time the procedure was not known to give a degree of palliation sufficiently greater than that following blood transfusion. It therefore seemed wise to await the verdict of time. Giffin and Szlapka have recently studied the condition of these fifty patients. They found that 21.3 per cent of those with pernicious anæmia survived the operation three years or more,

living two and one-half times as long as the average of a similar group of non-splenectomized patients at the same stage of the disease, and that 10.6 per cent are alive after more than five years. This clearly indicates that in at least one-third of the cases the average life of patients with pernicious anæmia is greatly prolonged, and in about 10 per cent the prolongation is sufficient to lead to the hope that in some cases cures may result. In certain early cases of a type not as yet fully recognized splenectomy offers a possibility of cure. Not only is this true, but also in the average cases the palliation following splenectomy is much greater than that obtained by blood transfusion.

One of the functions of the spleen is to destroy deteriorated red cells. Apparently in pernicious anæmia the red cells are born feeble and the spleen sacrifices red cells which, although imperfect, are the best the patient can produce and are capable of functioning. Removal of the spleen stops this destruction, but does not greatly affect the disease otherwise. The cases which seem to be most favorable are those in which hæmolysis is most active and those least characteristic of the disease. It also seems very certain that the prospect of benefit is better in early than in late cases. When the disease has advanced to the point at which the bone marrow has been injured beyond the power of recuperation the most to be expected is a temporary abatement of the symptoms.

The operation of splenectomy for pernicious anæmia is simple. Three deaths occurred following operation on the first nineteen patients. Operation was performed during crises as a last resort in very advanced cases. The best plan is to give one or two transfusions in order to get the patient on the up-grade before operating, and not to operate during a crisis. No operative deaths have occurred in the last forty cases.

Many observers have expressed the belief that toxic materials from the gastro-intestinal canal are the cause of pernicious anæmia. In a former communication the author discussed the physiology and pathology of the right half of the large intestine, his interest being excited primarily by the frequency of surgical tuberculosis and carcinoma of the large intestine and further by the work of Lane on intestinal stasis. Carcinoma or tuberculosis of the proximal half of the large intestine produces an anæmia unexplained by hæmorrhage which is much more severe than the anæmias of carcinoma or tuberculosis of any other part of the body. Experience with a large number of resections for the relief of anæmic patients in wretched general condition with oedema of the extremities, etc. has shown a comparatively low mortality and a high percentage of permanent cures.

Some very interesting observations on balantidium coli as the cause of blood and cord changes of the pernicious anæmia type have been made by Logan of the Mayo Clinic, and in a certain degree the cases studied support the hypothesis of the intestinal

origin of pernicious anæmia. The balantidium coli is a flagellate parasite which rarely inhabits the intestinal tract of man, but is common in the pig. In any event the pernicious anæmia of balantidium coli progresses to a fatal issue.

There is not much evidence that the etiological agents of pernicious anæmia arise in the large intestine. The blood conditions of all patients who have disease of the large intestine must be studied to ascertain whether anæmia, achlorhydria, glossitis, or some other abnormal condition exists, and especially to study with care from this standpoint all cases in which the large intestine is removed or splenectomy is performed.

BLOOD AND LYMPH VESSELS

Fitzwilliams, D. C. L.: Nævi in Children and Their Treatment. *Practitioner*, 1921, cvii, 153.

This article is based on the results obtained in more than 700 cases in which careful notes were kept and on 300 additional cases without notes.

A nævus is defined as a blood-vessel tumor growing by the formation of new vessels. Probably all nævi start in an increased growth of the ordinary capillaries, new ones forming in much the same way as capillaries form in granulation tissue. The capillaries are crowded together with very little interstitial tissue between them. In deeper tissues the capillaries at times run together when the fine septa between them break down, and cavernous spaces form. The older the nævus, the more apt this is to happen. As long as a nævus is spreading, it is surrounded by a band of spreading, actively-growing capillaries.

The only classification of value is one based on position. Nævi in the skin and mucous membranes are cutaneous, mucous, or superficial; those in the deeper structures are subcutaneous; and those in both are transitional. Of 853 nævi noted, 58 per cent were superficial, 35 per cent transitional, and only 8.5 per cent subcutaneous. As superficial nævi spread to the deeper tissues, many transitional nævi have been superficial at some time.

The cause of nævi is not known. They are seen only in fat, healthy infants. Their incidence is 65 per cent in females and 34 per cent in males.

Fitzwilliams states that in his experience they are nearly all present at birth.

They occur on the head and neck as often as upon the rest of the body. The long axis of the nævus will always be found to lie in the same direction as the nerve which supplies the part. Nævi appear near the place where the nerves become cutaneous.

Some disappear spontaneously later in life. Some ulcerate and disappear.

Spider marks or telangiectases may be destroyed by injecting a little local anæsthetic and destroying the vessel by means of a hot knitting needle or the electric cautery. Following the application then of a little ointment a complete cure will result.

The cutaneous nævus should be treated without delay before it has had time to invade the subcutaneous tissue. In the early stages it may be destroyed by carbon dioxide snow. If it is large it may be necessary to apply the snow in two or three places. Care must be taken that the frozen areas do not overlap and the process must be repeated in order to deal with the untreated areas.

Excision is equal in every respect to the use of carbon dioxide snow, but must be carried out carefully if scars are to be avoided. Electricity is not so suitable for these cutaneous cases and is much inferior to the other methods mentioned.

Excision is the best method of treating the subcutaneous and transitional types. The next best is the use of the heat cautery, preferably the Paquelin type. The author describes the technique of excision and the use of the heat and electric cautery in detail.

The series of cases reviewed did not include the small spider marks or so-called "nævroid" conditions. The treatment for these is very similar.

CARL R. STEINKE, M.D.

Alglave, P.: The Surgical Treatment of the Varicose Ulcer (Au sujet du traitement chirurgical de l'ulcère variqueux). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 945.

On the basis of his clinical experience and research during a period of twenty years Alglave concludes that total resection of varices is the only rational curative or preventive treatment of varicose ulcers.

Experience has shown that the Moreschi-Reclus treatment of varicose ulcer (interruption of the blood column which distends and alters the venous walls by its weight and sectioning of the vascular nerves) is uncertain in its results. The fundamental principles on which total resection is based are as follows:

1. Every varicose ulcer has its point of origin in a varicose vein.
2. Such an ulcer begins where a diseased vein adheres to the skin.
3. The presence of a varix threatens the further development of ulcers in addition to those already present.
4. Total resection of varices is a rational method of removing the mechanical causes which increase the blood pressure in veins already diseased or in those predisposed to varicosity. Such predisposition may be congenital or acquired.

Of seventeen of the patients operated upon by Alglave fifteen have remained cured, one for eight years, six for fifteen years, two for four years, three for three years, and three for two years. Recurrence was reported in two cases, both of which were cases of complex ulcers.

Alglave differentiates the typical or simple varicose ulcer originating from a varix alone from the more or less complex ulcer which has its origin in a symptomatic or secondary varix to which other factors are added. In the latter the limb may have been formerly affected by phlebitis or there may have been a frac-

ture or other traumatism more or less seriously involving the veins. The simple varicose ulcer is more often amenable to surgical treatment than the complex ulcer.

W. A. BRENNAN.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Llisterri, P.: The Chemistry of Traumatism (Química del traumatismo). *Rev. méd. de Sevilla*, 1921, xli, 1.

Proteolysis following trauma is a purely digestive function which is limited in its scope. The agent charged with tissue proteolysis is the polynuclear leucocyte. This is digestive, not phagocytic, as it destroys the tissues by its trypsin. The leucocyte activity in the production of trypsin ceases when all necrotic tissues have been digested and eliminated.

Just as there are certain bacteria which favor intestinal digestion, so also in open wounds there are those which favor proteolysis without intoxicating the organism. The sporogenic bacteria are the most active in proteolysis, and associated micro-organisms appear to have a more powerful proteolytic action than any one particular bacterium.

Llisterri suggests the treatment of wounds by auto-vaccination. Wounds irrigated with dead cultures of streptococci will be freed from active streptococci. The efficacy of such treatment was proved during the war. The auto-vaccination of wounded tissue opens up a new field of surgical investigation and therapeutics.

W. A. BRENNAN.

Waterman, N.: Serodiagnosis of Carcinoma (Die Serodiagnostik des Carcinoms). *Nederl. Tijdschr. v. Geneesk.*, 1921, lxxv, 197.

The miostagmin reaction of Ascoli and Izar is the best of all the serological methods for the diagnosis of cancer. It is always positive in cases of cancer of the internal organs and becomes negative when the tumor has been removed and prolonged radiation has been given. As an antigen the author prefers methyl-alcoholic extract of normal dog pancreas or acetone extract of lecithin preparations.

After testing the reaction upon normal serum Waterman uses the serum of the cancer patient. In counting the drops he employs the electric bell counter of Traube. The blood is obtained from the patient in the morning before he has had any food. The serum separates at room temperature and is kept in the ice box for two days at 5 degrees C. Before the test is made it is kept at room temperature for two hours and is then mixed with the antigen. The vessels and tubes must be kept free from alkali and fat.

From a series of 108 cases the author concludes that the reaction is positive in all cases of internal cancer but not in all cases of skin cancer. Erroneous positive reactions were obtained in cases of hepatitis, luetic splenitis, prostatic hypertrophy, tuberculous peritonitis, and diabetes with acidosis. Chiefly on account of the uncertainty of the antigen Waterman

believes that at present the method is a strictly laboratory procedure and not practical for general use in the clinic.

DUENCKER (Z).

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Wilson, L. B.: Dispersion of Bullet Energy in Relation to Wound Effects. *Mil. Surgeon*, 1921, xlix, 241.

Very puzzling effects are often caused by the entrance of missiles into tissue. A great, jagged wound of entrance may be made by a shell fragment which has penetrated only a short distance, yet has caused injury only an imperceptible distance from those parts actually touched in its course. The entrance wound may be almost imperceptible, yet interiorly the tissue is pulped at a distance of more than 1 cm. from those portions actually touched in passage. A study of this kind must be confined to missiles of regular form and approximately known velocities.

Missiles of high velocity arouse the greatest interest. Although bullets of 1,600 to 2,000 f.s. velocity were used in the Revolutionary War, there is no authentic record of wound production by these missiles. With the Civil War bringing out the necessity of rapid fire, cartridges were substituted for the older methods, and these reduced the velocity to about 800 f.s. Not until the copper-jacketed bullets and smokeless powder came into use could velocities again be increased to 2,000 f.s.

Kocher made the earliest experiments on wound injuries from high velocity projectiles about 1875. Following this, numerous other men have made observations, including Sir Victor Horsley in England and Colonel Lagarde in this country. Most of the observations were made on the bodies of men and animals, though some were made on cans containing water, clay, marble, etc. Although these studies were made on missiles of about 2,000 f.s. velocity, while those of today are from 2,500 to 3,000 f.s., they are important because at long range the highest velocity missiles fall to velocities of those of the older type.

Very few purposely deformable, and still fewer truly explosive bullets were used by any European nation during the recent war. The fact that explosive effects were so rarely seen during the Spanish American war is accounted for by the fact that missiles of 2,000 f.s. velocity were used at short ranges. The explosive effects must therefore be sought in the explosive energies of ordinary bullets, either when undeformed and flying true, or when deformed and flying erratically.

The principal "explosive effects" produced by undeformed high velocity rifle bullets flying head on are comminution of bone, the "blasting out" of soft tissues at the point of exit, the pulping of soft tissues around the track of the missile, and injuries to distant parts by energy transmitted through fluid. A low velocity bullet will shatter a bone which one

of high velocity will pass cleanly through. Missiles which strike bones of high density are followed by less local shattering than those which strike bones of lower density—the shafts of long bones less than the head, etc.

The variation in the effects of “blasting out” of soft tissues at the point of exit is explained largely by a consideration of secondary missiles, that is, the placing in motion of fragmented tissues, particularly bone. One of the least appreciated effects is the pulping of soft tissues along the track of high velocity rifle bullets.

Most of the experiments conducted previous to those made by the author had been on dead bodies, sand, clay, etc. which do not readily lend themselves to an accurate determination of the distance to which the energy of high velocity missiles may be transmitted. The author chose gelatin as the most suitable medium because of its translucency and easily controlled densities. This report is merely preliminary as the experience of war has opened up many ramifications of the problems involved.

Gelatin was used in densities of 5, 10, 15, and 20 per cent, and was molded into blocks $3\frac{1}{2}$ by $4\frac{1}{2}$ by 2 in. The masses were fired through at a standard range of 50 ft., using the regular charge in a Springfield rifle. In addition to observing the shattering of the gelatin masses, various other means were taken to measure variations in the dispersion of energy. These included powdered charcoal on the surface or in a small area in the center of the mass and threads or delicate silk net embedded in the gelatin.

Summing up the results without any attempt at high mathematical accuracy, it is shown that the energy of a high velocity missile passing through gelatin of different percentage densities is dispersed in an explosive degree to distances approximately inverse to the squares of the percentage densities. These experiments have been supplemented by similar studies on living and dead animal tissues and by observations of fatal war wounds. So far as one can estimate the relative densities of tissues, the principles worked out for gelatin seem to hold for cartilage, fibrous connective tissue, muscle masses, and soft glandular organs. It has been impossible by the methods so far adopted to measure the dispersion of energy in fluids.

One practical lesson from the experiments is that rifle and machine gun bullets of high velocity show destruction of soft tissues even when no bone has been struck, at distances much farther from the track of the missile than one would expect, as much as 1 cm. This necessitates wide débridement of the track of the bullet. One must also not lose sight of the great evulsive effects of the missile in ripping out fibers of connective tissue, particularly from muscle aponeuroses and the sheaths of vessels and nerves.

Another point is that the softer the organ or tissue, the further away from the track of the missile will serious secondary results of injuries occur. Soft glandular organs, such as the kidney, spleen, and

liver, and the nerve trunks, which have not even been touched by high velocity bullets, may be seriously affected by the transmission of energy to them through intervening soft parts.

Another striking result is the production of minute injuries to the intima of blood vessels due to the transmission of energy through a medium of low density and viscosity. The gelatin experiments seem to indicate that the transmission of explosive energy is related more directly to variations in viscosity than in density; that is, the less the viscosity, the farther the energy is transmitted. The important thing for the military surgeon to bear in mind is that when a high velocity bullet has passed through or even near an important blood vessel, minute slit-like lesions of the intima which may be scattered far away from the parts actually touched are almost certain to occur, and these lesions in the intima, even if uninfected, may cause thrombosis, fatal secondary hæmorrhage, or slowly developing aneurisms. The lesion may also be a focus for bacteria in the blood stream. When a bullet has passed completely through and out of the body or limb, indicating its relatively high velocity, and either through or in close proximity to an important blood vessel, and when at the same time the tissue is evidently pulped at a considerable distance from the track of the missile, the only safe surgical procedure is ligation of the vessel at a relatively great distance from the track of the missile.

O. S. PROCTOR, M.D.

Fromhold, E. E., and Nersessoff, N.: Artificially Produced Jaundice (Ueber kuenstlich erzeugten Ikterus). *Referativny Medizinsky J.*, 1921, i, 163.

Jaundice can be produced experimentally either by ligating the cystic duct or by poisoning the animals experimented upon. It is possible also that it might be produced by the direct introduction of bile pigment into the blood. To throw light on this question the authors introduced a solution of bilirubin in caustic soda into the auricular veins of rabbits. The bile pigment was shown to be toxic; if too large a dose, i. e. more than 0.1 gm., was introduced the animals died with diarrhoea and cramps. When the dosage was carefully regulated death did not take place even after repeated injections.

In spite of the fact that large quantities of the deep-staining pigments were introduced, no very pronounced discoloration of the sclera, skin, or internal organs was noted in any case, and in only a few was a slight yellow color observed. In no case was Gmelin's urine reaction positive. The behavior of dogs in this respect was quite different. Two experiments on dogs showed that the kidney is readily penetrated by bilirubin, but in these animals also there was no general jaundice.

Hence it appears that for the production of icteric coloring the presence of bilirubin in the blood plasma is not sufficient; the pigment must be visible through the walls of the blood vessels or must even color the tissues.

The conditions under which bilirubin is able to pass through the kidney are not yet fully explained. As was demonstrated by the authors' experiments, this may occur in rabbits when the cystic duct is ligated. The experiments showed also that albumin frequently appears in the urine, as is often noted in clinical cases of jaundice (hyalin casts and traces of albumin).

If bile pigment is repeatedly introduced into the blood of the rabbit, urobilin and urobilinogen in large quantities soon appear in the urine. This sign is constant and always very pronounced.

The experiments reported were the first in which an artificial urobilinuria was produced.

VON HOLST (Z)

Inlow, W. D.: The Spleen and Digestion. *Am. J. M. Sc.*, 1921, clxii, 325.

From the earliest times the spleen and the stomach have been supposed to possess some close interrelationship. Baccelli, in 1868, demonstrated a gastro-splenic circulation through the vasa brevia and first put forward the theory that the spleen plays a rôle in the elaboration of pepsin. Subsequent studies of this question have been made on dogs by testing gastric secretion before and after splenectomy. This has been done by means of gastric fistulæ, Pawlow pouches, and the removal of secretory meals through the stomach tube. Similar studies on man have been made by gastric analyses after splenectomy. The results of these experiments, which have been contradictory, may be summarized as follows:

1. Removal of the spleen causes a diminution of the proteolytic power of the gastric juice.
2. The injection of splenic extracts, of leucocytes, and of extracts of lymph glands increases the proteolytic power of the gastric juice of splenectomized animals.
3. Removal of the spleen causes an augmentation of the proteolytic power of the gastric juice.
4. Removal of the spleen has no effect whatsoever on gastric secretion.

The chief theory put forward by the first group of investigators was that during digestion the spleen gives to the blood stream a substance which activates or leads to the further elaboration of the gastric enzymes, especially pepsin.

In this experimental study Inlow reports data concerning the gastric secretion findings before and after splenectomy on three dogs with accessory stomach pouches (secretory meal of meat) and on two similar dogs serving as controls. Removal of the spleen in these experiments caused no noteworthy changes in the gastric secretion except a slight diminution in the quantity of gastric juice obtained.

The author is led to conclude from his experimental inquiries and a critical review of the literature that a definite pepsinogenic function of the spleen has not been demonstrated and that the relation of the spleen to gastric secretion is probably merely vascular, the diminution in the amount of

juice secreted after splenectomy being attributable to a decrease in the gastric blood supply due to injury to the gastro-splenic circulation.

ROENTGENOLOGY AND RADIUM THERAPY

Morrell, R. A.: Some Effects of Radiotherapy upon Fibrous Tissue. *Arch. Radiol. & Electrotherapy*, 1921, xxvi, 78.

Although too few cases were treated to warrant definite conclusions regarding the value of the method, the results obtained were sufficiently encouraging to warrant a more general application of it. There was one feature common to all the successful cases. The symptoms complained of were due to the ill effects of fibrous tissue. This scar tissue resulted from operative measures rather than from the actual wounds received in action; the tissue was therefore 'young' rather than 'adult' tissue. In two of the unsuccessful cases the reverse condition was present: the tissue was of a much older nature and due to some form of fibrositis.

Four groups of cases were treated. Group 1 comprised cases of brachial plexus injury with marked scar tissue. The two cases of this group received decided benefit from radiotherapy. In Group 2 three cases of sciatic nerve involvement were greatly improved, but two others in which there was a fibrositis of long standing failed to show improvement. Group 3 included two cases in which the long flexor tendons were caught up in scar tissue. Both of these responded favorably. Group 4 was represented by a single case of painful nerve bulb in which the treatment proved very successful. Four cases of extensive superficial scars with pain due to involvement of nerve endings received no benefit from radio-therapy.

In all of the cases treated successfully by radio-therapy other methods had been used previously with little or no improvement. The benefits derived manifested themselves by a decrease in the limitation of movement and alleviation of the pain. The scar tissue became softer and more pliable.

As regards the technique employed, the author states that a 16-in. coil and Coolidge tube were used, the parallel gap was 9 in., the current, 3 ma., the filter, aluminum, generally 3 mm., and the distance of the anti-cathode from the skin 14 in. The dose measured on the skin and pastille was checked by a Corbett tintometer to $\frac{1}{2}$ B, i.e., 2B at half distance. The treatment was given at intervals of three days. The number of treatments varied.

The histories of the various cases are reported in detail. ADOLPH HARTUNG, M.D.

Ewing, J.: Tumors of Nerve Tissue in Relation to Treatment by Radiation. *Am. J. Roentgenol.* 1921, n.s. viii, 497.

In general, the structural characters which determine susceptibility to radiation are cellular: an undifferentiated form of the cells; rapid growth with abundance of mitoses; vascularity, especially when

due to abundance of delicate capillaries; and absence of much intercellular substance. Tumors prove relatively unsusceptible when the cells are differentiated and adult in type, when they grow slowly and mitoses are few, when the blood supply is through well-formed adult vessels, and when there is much intercellular substance. Considering the tumors that affect nerve tissue—in the brain, meninges, spinal cord, and peripheral nerve trunks—one finds very wide variations in the particulars mentioned, and if the rules hold, similar variations in the response to radiation should be expected.

Neurofibroma and neurosarcoma belong structurally to the class of non-susceptible tumors; accordingly one finds that these tumors are exceedingly resistant to all forms of radiation in any dosage that can be applied safely through the skin. Of the endotheliomata, psammoma, or sand tumor, offers great resistance to radiation unless radium is applied directly to the growth or is inserted within it. Rarely, vascular and cellular endotheliomata are encountered which may be more susceptible, but whenever the cells are of adult endothelial type and of pavement form, they cannot be regarded as a very favorable type for treatment by radiation unless radium can be inserted within the tumor.

True angio-endothelioma or perithelioma should be more susceptible. Angiosarcoma, as far as the tissue itself is concerned, ought to be markedly influenced by radiation since its nutrition is very unstable, but whether a slow and safe regression can be effected appears doubtful, especially when the tumor is bulky. On the other hand, as very few successful surgical removals of such growths have ever been accomplished, experimentation is justified. Of all tumors of the brain and spinal cord, glioma in its various forms presents most of the structural features that favor susceptibility to radiation. Primary carcinoma of the brain structurally indicates a high degree of susceptibility to radium. However, this and other tumors springing from the ventricles or pineal gland is well protected by distance from the attack by radiation. The very delicate structure of such growths, however, encourages the hope that they may in some instances be favorably influenced by the physical agents.

Of the group of hypophyseal tumors, cysts offer no encouragement for radiation therapy. Chronic hypophyseal struma with acromegaly has been definitely influenced by roentgen rays directed through the temporal regions. It is the author's belief that success will eventually be attained by exposing these tumors for direct radiation or by inserting minute quantities of radium within them. It cannot be said that hypophyseal struma, being a form of functional hyperplasia, is very susceptible to radiation. The cellular adenocarcinomata are more so. In either case the bulk of the tumor should render the insertion of radium a safe procedure if infection can be avoided.

The hypophyseal duct tumors belong in the class of basal-cell carcinomata and should respond well

to radium. The slow course of most hypophyseal growths and the peculiar clinical symptoms due to functional disturbance of the endocrine system constitute very delicate indicators of any therapeutic effect that may be produced upon them and render this field of unusual interest in radium therapy.

The successful and safe use of radiation in the treatment of intracranial and intraspinal tumors is dependent upon getting a sufficient dosage to the tumor without injuring the overlying tissue. Allowance must be made for the density and thickness of the intervening structures. That an effective dosage of radiation sufficient to influence the growth of cellular tumors can be delivered through the adult skull to all portions of the brain, can be shown by physical computation and has been demonstrated experimentally by the work of Bagg on dogs and monkeys. Whether such dosage will prove sufficient to bring any of these tumors to a standstill or to definite regression can be determined only by experiment on the human subject. In children, the comparative thinness of the skull, the smaller size of the brain, and the more frequent occurrence of cellular tumors suggest that external radiation should be employed before other methods are used.

Another factor which deserves consideration is the increased intracranial pressure which is usually associated with brain tumor. Full radium dosage may be expected to produce hyperemia, an increase of intracranial pressure, and probably some oedema before it can cause any definite recession in the bulk of a tumor. Therefore, unless the patient can withstand a certain temporary increase in the pressure, the application of radium may be followed by aggravated symptoms.

When the tumor can be exposed, it becomes accessible to the direct application of radium or to the insertion of emanation needles. The last method is undoubtedly the most effective without regard to the structure of the tumor, but is accompanied by the danger of infection and the risk of injury to normal brain tissue. If radium needles are to be used it is highly important that the tumor tissue should not be disturbed by partial excision as it acts as a filter protecting the normal unaffected areas. The practice of attempting to remove as much as possible of the tumor and then turning the case over for radium treatment generally assures failure and discredits radium therapy. With few exceptions, surgery should be used only to expose the growth when a brain tumor is to be treated with radium. Cordial coöperation and mutual understanding between the surgeon and radiologist are essential if success is to be achieved in this field.

ADOLPH HARTUNG, M.D.

Bettman, R. B.: The Removal of Embedded Needles in Broad Daylight with Intermittent Fluoroscopic Control. *Surg. Clin. N. Am.*, 1921, 1, 1163.

The author describes an operating fluoroscope he has devised with which he is able to operate in

broad daylight and have at hand the means of obtaining fluoroscopic aid without danger to asepsis.

This fluoroscope is similar to the hand fluoroscope in common use. It fits snugly against the operator's forehead and cheeks so that when the screen is down it is light tight. It weighs very little. The straps over the head are adjustable. The screen is on a hinge and is held closed by a spring. When the screen is open the spring holds it open. At the same time a bit of ruby glass to preserve the pupillary accommodation is raised before the operator's eyes. A young man or one with good accommodation to light can dispense with the red glass.

Lead glass like that used for the fluoroscopic screens in common use is placed at the base of the hood to protect the operator. The screen is the usual fluoroscopic screen.

When the screen is opened the surgeon has direct vision. When the screen is closed he can see the fluoroscopic images exactly as if he were in a dark room using an ordinary fluoroscopic screen. After the fluoroscope has been adjusted to the head it is covered with a sterile cloth through which the screen can be manipulated.

The usual fluoroscopic table with the under table sliding tube box installed in every X-ray department is amply sufficient.

Bettman describes the use of this fluoroscope in detail in the removal of a needle fragment embedded in the hand.

FREDERICK CHRISTOPHER, M.D.

Carter, L. J.: The Treatment of Tuberculous Cervical Adenitis: Results from the Use of Fractional X-Ray Dosage in One Hundred Cases. *J. Radiol.*, 1921, ii, 22.

The author believes that the roentgen ray can cure any tuberculous cervical adenitis that surgery can remove and do it with less discomfort to the patient and less danger of spreading the infection. The only indication for surgery is given when a caseous gland has broken down as the result of secondary infection or through liquefaction necrosis and is pointing toward the skin. In such cases the detritus or the pus should be evacuated by the smallest skin incision.

The aim in applying roentgen therapy should be to imitate nature's method of producing a cure. A study of the pathology of tuberculous glands and the changes occurring in them during the healing process reveals a hyperplasia first of the lymphocytes and subsequently of fibrous tissue elements. Treatment should be applied with a view to stimulating these defensive forces rather than to causing destruction. The hard rays commonly used tend to produce the latter result. The author believes that rays of medium softness give a desirable stimulation and therefore are preferable. This conviction was confirmed by several unfortunate experiences in which glands were given highly filtered intensive treatment and the condition was aggravated rather than alleviated. The good results obtained in sanatoria with heliotherapy also speak for the

value of stimulation. Above all, the uniformly good results obtained in one hundred cases treated by rays of medium penetration are convincing proof of their value.

As regards the technique advocated, Carter states that the rays used were as soft as was consistent with thorough penetration and safety to the overlying tissues. A 2 mm. aluminum filter was used. Rays backing up a 5-in. parallel spark gap were applied at a 10-in. focal distance for a period of five minutes, a 4 m.a. current being used. This gave approximately a skin dose underneath the filter or seven-eighths of a skin dose in the glands. One such treatment was given every five to seven days until there was a marked decrease in the size and inflammatory condition of the glands. The usual number of treatments necessary was eight to ten. The interval between treatments was then extended to two weeks and they were continued thus for a period of six to nine months. The patients in this series who continued the treatment until they were discharged as cured received an average of twenty-four treatments, each series extending over an average period of ten months.

Simultaneously with the roentgen therapy certain general measures common to the treatment of all forms of tuberculosis were carried out. Of cardinal importance was the hypodermic use of tuberculin at a dosage short of producing a systemic reaction. The possible existence of foci of infection should be borne in mind, and if they are located, they should be promptly eradicated.

In one of the early cases of the one hundred upon which this report is based, telangiectasis was produced where an erythema of the skin occurred. During the course of the treatments about ten of the glands broke down and required evacuation. This was done through a very small skin incision, which promptly healed. There was no case of unhealed tuberculous sinus. There was recurrence in only two cases which were discharged as cured. These cleared up on further treatment and have remained quiescent to date. In thirty of the cases the cure dated back over five years.

In only two cases was there anything to indicate that the treatment might possibly have any effect in spreading tuberculous infection. One of these patients died of tuberculous meningitis and the other of acute miliary tuberculosis. The author does not believe there was any causal relation between the treatments and the subsequent development. Five patients changed their residence and transferred their treatment to other radiotherapists. Six patients failed to follow up the treatments after they had merely begun them. Eleven patients are continuing the treatment, progressing favorably, but are not yet ready for discharge as cured. The rest of the hundred have been discharged as apparently cured. The glands have been reduced to the merest kernels, and the general condition has been restored to one of well-being.

ADOLPH HARTUNG, M.D.

Groeschel, L. B.: Gastrocolic Fistula. *Am. J. Roentgenol.*, 1921, n.s. viii, 516.

Gastrocolic fistula is not a rare condition, but the fact that it is seldom diagnosed is evident from the relatively small number of cases reported in the literature. In the case reported by the author the fistula was diagnosed by means of the roentgen ray following the injection of an enema of barium and mucilage of acacia and demonstrated both by the fluoroscope and the plate on several occasions. A detailed history of the case is given, together with the laboratory and roentgen findings. Several roentgenograms are included.

ADOLPH HARTUNG, M.D.

Bevan, A. D.: X-Ray Burns. *Surg. Clin. N. Am.*, 1921, 1, 935.

X-ray burns are painful. The pain is probably due to the obliteration of blood vessels which robs the nerves of their normal supply of blood as in senile gangrene. The pain is often so severe that the use of opiates is necessary. In severe burns not only the skin but the deeper tissues may be destroyed. These very rarely result in cancer. The superficial burn, so-called X-ray dermatitis, is more apt to lead to epithelioma. Many of the earlier X-ray technicians lost their lives from this sort of cancer before the proper protective precautions were taken.

In the treatment of severe X-ray burns excision gives the best results. The whole damaged area is removed *en bloc*, the dissection being begun well outside the burn and including tissue underneath it. The area is then covered with Thiersch skin grafts which are covered with one thickness of gauze very carefully applied. Over this is placed a layer of several thicknesses of sterile gauze which in turn is covered with a sterile gauze roller about 5 in. in width. Over this is placed a starch bandage which, when dry, fixes the dressing accurately in position. This dressing is left in place four or five days if there is no reaction, and is then removed carefully so as not to lift the grafts from their bed.

Too much time should not be spent treating these burns with salve and various dressings. As soon as it is recognized that certain portions of skin are too greatly damaged to recover they should be removed and skin grafts should be used. This makes the development of epithelioma as remote as possible.

The author reports two cases of X-ray burns of the leg which teach that the X-ray may do much harm and should be used only by experts.

MARCUS H. HOBART, M.D.

Bérard: The Treatment of Cancer with Radium (Sur le traitement du cancer par le radium). *Lyon chirurg.*, 1921, xviii, 503.

From a study of the statistics given in the literature Bérard concludes:

1. That in the treatment of cancer of the uterine cervix, radium, either alone or combined with intensive X-ray treatment, has given undoubted

clinical cures, some of which have been controlled as long as eight years.

2. The recoveries resulting from operation still seem more numerous than those due to the use of radium alone, but less numerous than those obtained from the employment of radium combined with intense X-rays.

The operative mortality varies from 5 to 20 per cent according to the gravity of the condition. The risk of death is not negligible in treatment with radium; ordinarily it is between 8 and 10 per cent.

In the second part of his article Bérard deals at length with the accidents which may result from radium treatment. The majority of such accidents and the total failures are due to errors of technique. The former include ulcerations consecutive to burns and necrosis of insufficiently protected tissues, infective and septicemic complications following the introduction of radium tubes into ulcerated cervical cancers, diffuse phlegmons arising from the introduction of radium tubes into ulcerated and infected tumors, and perforations of natural conduits and septa by the tubes.

In Bérard's opinion wide surgical excision is indicated if the tumor and invaded glands can be removed *en masse* and should be preceded by radium and intense X-ray treatment to sterilize the cancerous elements already disseminated in the lymphatics though not clinically discernible. The application of radium and the X-rays after surgical operation seems of value only if there has been difficulty in liberating the tumor and there is a possibility that some of the neoplastic elements have been left behind. With the exception of cancers which are still local, the use of radium is becoming more and more applicable as the operative mortality or the danger of recurrence increases. Bérard believes that in cases of infiltrating cancer of the cervix the Wertheim and all other extended hysterectomies are inferior to the use of radium alone or combined with the X-rays.

W. A. BRENNAN.

LEGAL MEDICINE

Reasonableness of Requiring Morbidity Reports.

Smythe vs. State (Miss.), 86 So. R., p. 870.

The Supreme Court of Mississippi holds that, under a provision of the code empowering the state board of health to make and publish all reasonable rules and regulations necessary to enable it to discharge its duties and powers to carry out the purposes and objects of its creation, a regulation requiring every licensed physician practicing in the state to file a morbidity report on the first day of each month is not unreasonable. It is not only reasonable, but an important and valuable aid in the preservation of the public health.

The defendant testified that he had never received a copy of these regulations; that he had no knowledge of the existence of the rule requiring reports to be made on the first day of the month; that, prior to the

administration of a named county health officer it had been the custom in that county to file these reports on or about the tenth day of each month, and that in so doing the physicians were acting under the directions of the county health officers.

As there was no presumption that the defendant had knowledge of a mere rule or regulation of the state board of health, and as under the evidence the peremptory instruction requested by the defendant should have been granted, the court reversed a judgment of conviction for unlawfully and knowingly violating a rule or regulation of the state board of health and discharged the defendant.

J. A. CASTAGNINO.

Efforts Should Be Used to Save Injured Arm or Leg. *Wrenn vs. Connecticut Brass Co. et al (Conn.)*, 112 *Al. R.*, p. 638.

The plaintiff, on March 6, 1915, sustained a fracture of the left forearm, following which his arm remained in a twisted and unnatural position. A competent surgeon was of the opinion that bone grafting would in some measure restore its function. The operation was performed, and by the latter part of April, 1916, the forearm had become straight, and the surgeons believed that a good functional result would follow. Instead, a suppurative process persisted and June 26, 1916, it was necessary to operate further. The second operative wound was healed by August, 1916.

The arm has never been a useful member since the original injury, and at no time has it been possible to use it for industrial purposes. The period

of incapacity for which the injured employee was entitled to compensation did not cease and the condition of complete and permanent loss of the arm exist did not exist until August, 1916, to which time treatment was continued and at which time treatment was discontinued as the wound had healed. At the end of this period he was entitled to compensation for the complete and permanent loss of the use of the arm.

The court stated that all reasonable effort should be used to save an injured arm or limb and thus prevent the necessity for its amputation or the complete loss of usefulness of the member. Until the time for such effort has passed, professional skill should be directed to effect a cure. When competent professional opinion on fair examination reaches the conclusion, or should reach the conclusion, that it is not reasonable to expect to cure or improve the injured arm, it can then be said for the first time that the loss of this member has occurred. This, however, does not compensate the injured employee for the period between the date of the injury and the date of the determination of the complete loss of use. The loss of the arm through amputation occurs when the amputation takes place. The complete and permanent loss of the use of the arm occurs when no reasonable prognosis for complete or partial cure and no improvement in the physical condition or appearance of the arm can be made. Until such time the specific compensation for the loss of the arm or for the complete and permanent loss of the use of the member cannot be made.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Daels, F.: The Alquié-Alexander Operation (L'opération d'Alquié-Alexander). *Bull. Acad. roy. de méd. de Belg.*, 1921, 5 s., 1, 298.

Although Daels has performed the Alquié-Alexander operation (extra-peritoneal shortening of the round ligaments) in 150 cases with only two recurrences, he is not satisfied with the usual technique. Suture of the round ligament to the posterior surface of the aponeurosis of the external oblique is not simple, and strong traction is necessary to obtain such fixation. Moreover, it cannot be effected at an appreciable distance from the incision; the sutures both of the ligament on the aponeurosis and of the two ends of the aponeurotic incision fall side by side if they do not actually imbricate. Therefore as a very wide opening of the inguinal canal is necessary and there is irregular cicatrization with sometimes necrosis of a part of the ligament and the aponeurosis, Daels sought a method permitting the use of a smaller incision in the inguinal canal and fewer aponeurotic sutures while assuring solid fixation of the ligaments. After trying various methods he finally decided to fix the shortened ligaments on the ligaments themselves.

He makes a lateral incision 3 or 4 cm. in length on each side at the level of the external ring of the inguinal canal, enlarges this ring with the finger or by section of the aponeurosis, and isolates the round ligament, drawing it out for a length of 6 to 10 cm. By means of a forceps he hollows a tunnel under the aponeurosis of the recti muscles and through the fibrous tissue of the median line to the inguinal canal on the opposite side. With the forceps he then brings the extremity of the right round ligament over to the left and the extremity of the left round ligament over to the right. The ligaments cross in the tunnel and are fixed to each other by a few sutures in the inguinal canal. As frequently it is difficult to free the round ligaments fully, he makes a vertical incision in the median line above the pubis and opens the sheath of the recti muscles, brings the ligaments here, ties them together, and then buries the knot and covers it by an aponeurotic suture. The round ligaments are maintained in contact for the entire length of their aponeurotic tract and form adhesions.

Daels has performed this operation in fifty cases. Since he has abandoned the extended aponeurotic suture there have been no cases of necrosis and no postoperative ill effects. One patient died of pneumonia sixty days after the operation during the influenza epidemic. Twenty-six of the forty-nine survivors have answered inquiries and twenty-five state that the result is perfect. In a few cases there

is some peri- or para-metritis. Therefore the results were excellent in 80 per cent of the cases, satisfactory in 95 per cent, and unsatisfactory in only 5 per cent.

W. A. BRENNAN.

Ransohoff, J. L., and Dreyfoos, M.: Dangerous Intraperitoneal Hæmorrhage from a Uterine Fibroid. *Surg., Gynec. & Obst.*, 1921, xxxiii, 296.

It is customary to regard uterine fibroids as benign tumors and to operate only when complications such as an increase in size, pressure symptoms, or metrorrhagia develop. However, intra-abdominal hæmorrhage may occur and, though very rare, is very serious. In nearly all of the reported cases there have been distinct evidences of trauma either external or internal. Various diagnoses such as ovarian cyst with twisted pedicle, extra-uterine pregnancy, perforation of gastric ulcer, and in one case, appendicitis, have been made. The hæmorrhages have usually been due to rupture of one or more dilated superficial veins just beneath the peritoneum.

In every reported case, however precarious the patient's condition, a hysterectomy was done but the authors believe that when the condition is desperate it would be a safer plan to transfix and ligate the bleeding vein on either side of the opening, delaying a hysterectomy until some future time after the patient's recovery. In a very serious case this certainly would be a life-saving measure.

C. H. DAVIS.

Kuehner, H. G.: Recurrent Adenomyoma of the Uterus. *Am. J. M. Sc.*, 1921, clxii, 424.

The patient, a single woman aged 43 years, entered the hospital, December 4, 1917, complaining of irregular, profuse, and painful menstruation and a mildly irritating intermenstrual watery discharge. At times she did not menstruate for five or six months, but recently had been bleeding every three weeks. The menses were profuse and exhausting, lasted from five to seven days, and were accompanied by severe pains in the back and general weakness. Her general appearance and nutrition were good. There was no weight loss, and the important functions, aside from menstruation, were normal. The hæmoglobin was 70 (Sahli) and the erythrocytes numbered 4,300,000. Bimanual pelvic examination revealed a firm mass about the size of a small orange occupying the vagina and protruding by means of a narrow pedicle through the cervix from within the uterine cavity. The exposed surface of the tumor mass was necrotic. The uterus was symmetrical and not enlarged.

The tumor was removed by vaginal myomectomy. The specimen consisted of several irregularly torn fragments of tumor tissue removed from the uterus.

The larger fragments showed partial covering by intact endometrium but elsewhere there was superficial necrosis. Some of the smaller and thinner plaques resembled portions of a cyst wall. Throughout the larger masses numerous small, oval, honey-combed areas of pinhead size were observed, some of which contained a pearly, mucoid material. Microscopic sections of the mass from the uterus showed a dense, waving, and interlacing fibromuscular structure through which were irregularly distributed abundant gland structures. These varied markedly in size and shape, some being small or oval, while others were dilated, cystic, and of irregular contour.

Although a few tortuous spaces were noted, presenting for the most part empty lumina, some of the cavities contained a homogeneous, mucoid material. The lining epithelium was of a tall columnar type and uniform throughout. Where the glands were dilated the parenchymal cells were to a degree flattened. Nuclear figures were not observed and there was no evidence of invasive qualities or atypical growth. It was noteworthy that not a few of the acinar structures were surrounded by a richly cellular stroma of concentric arrangement such as is seen in normal endometrium. Occasional mitotic figures were observed in the nuclei of these stroma cells. Still other alveolar elements were inserted directly between the muscle fasciculi of the tissue and displayed no accompanying stroma. The pathologic diagnosis was adenomyoma uteri.

Fourteen months later (February 1, 1919) the patient again sought the hospital with a return of all the clinical symptoms which preceded the first operation and, in addition, a definite metrorrhagia with its resultant secondary anemia. Pelvic examination disclosed a large firm mass the size of a foetal head tightly wedged in the vaginal cavity. Vaginal myomectomy was repeated. Because of the firm impaction of the mass in the vagina it was necessary to remove it piecemeal. As in the case of its predecessor, this tumor also hung into the vagina from within the uterus by means of a slender fibromuscular pedicle.

Several different sized pieces of tissue from the uterus, portions of which were discolored and superficially necrotic, were removed at the second operation. The surfaces of the tissue elsewhere were of a pale pink or red, moist, glassy appearance and in places showed a normal mucous membrane. On section through the fragments islands of pearly gray tissue were encountered which at intervals showed microscopic cyst cavities of varying size containing a gelatinous gray or brownish material. The tissue was oedematous and could be easily crushed between the fingers. Microscopic sections of the tissue presented a dense, though oedematous, fibro-muscular structure throughout which were scattered islands of glandular tissue. The alveolar structures varied greatly in size and shape, some being tortuous, and at times contained a mucinous material. The acinar epithelium was of columnar

type and occasionally surmounted a cone-like shaft of stroma which projected into the lumen in the manner seen in intra-canalicular fibro-adenoma of the breast. However, at no place was there any reduplication of the lining epithelium, no nuclear figures were observed, and there was no violation of the basement membrane nor papillary formation by parenchyma. For the most part the glands lay in a concentrically arranged, moderately cellular stroma which now presented rather marked myxomatous change. The pathologic diagnosis was adenomyoma of the uterus.

Three months after this operation (May 2, 1919) the uterus was found to be slightly enlarged. Eight months subsequent to the second operation (September 24, 1919) the patient returned, complaining of almost continuous bleeding. Pelvic examination showed the uterus to be considerably enlarged but quite regular in contour. Abdominal hysterectomy was advised and executed. The enlarged uterus was amputated above the cervix and removed with the attached adnexa of both sides. The uterus was opened through the posterior wall. It measured 13 by 9 by 5.5 cm. When reconstructed, the serosal surface was smooth and regular and yielded no evidence of tumor within the organ. The myometrium was very thick, especially at the fundus where it varied from 2.7 to 3.3 cm. in thickness. Toward the cervix it measured 1.7 cm. The uterine wall was tough, with apparently an increased fibrous connective-tissue content, and the blood channels therein were tortuous and thick walled.

On opening the uterus three distinct tumor masses were found. The largest one occupied almost the whole of the posterior wall of the organ and had been cut through; the second, a smaller one, about the size of an English walnut, was high in the fundus; while the third, which formed a symmetrical bulging of the uterine wall, presented itself upon the anterior surface. The uterine cavity was large and lined throughout by a thick intact endometrium of healthy appearance which was carried in unbroken continuity over the projecting tumor masses. The large polypoid mass on the posterior wall projected well into the uterine cavity and for a distance at its juncture with the myometrium was sharply demarcated, but for the greater part merged almost imperceptibly with the muscular coat. On the cut surface this tumor measured 7.0 by 3.8 cm. Its surface presented a variously nodulated contour and was covered by an intact mucosa which dipped into the mass to meet the irregularities of conformation. Section through the tumor mass revealed a variegated appearance. At places the tissue was quite firm, gray, smooth, and glassy and not easily crushed, while other areas displayed numerous thin-walled cysts containing a clear straw-colored fluid. The latter structures varied markedly in size and radiated in a cluster-like manner from a central fibrous core to which they were attached by a slender pedicle. These grouped cystic clusters gave this

portion of the tumor an appearance not unlike that of a hydatidiform mole.

The small cysts could be easily ruptured and the linings were smooth. This peculiar cyst formation gave the mucosal aspect of the tumor its peculiar appearance. At places the endometrium dipped into and over irregular cavitations in the tumor, the walls of which were composed of a thick, pale membrane. When such membranous sacs were opened their inner lining in turn was observed to be studded by inward-projecting, lobulated, cauliflower masses. Nothing more than a thin watery fluid was found in such cavities.

At one point on the surface an oval, sessile bulging was noted which contained two small typical cauliflower masses. These hung from a narrow base into the otherwise smooth, empty cyst. At the juncture of the tumor mass with the myometrium several rather large channel structures were observed, and these, also, presented the characteristic fungoid papillary projections into the otherwise smooth-lined cavities. It is noteworthy that these papillary ingrowths were somewhat more easily crushed than the remainder of the neoplastic tissue. The smaller nodule in the fundus was about the size and shape of an English walnut. Its mucosal covering was complete and the component tissue was of soft consistency. This mass also presented the characteristic cysts with a pale membrane comprising the cyst wall and the typical polypoid cauliflower projections into the cyst cavities, as noted in the larger mass. Several cysts in this instance were filled with a chocolate-colored fluid. The nodule was not sharply defined against the underlying uterine musculature although it did not invade the myometrium to any great depth. The oval sessile symmetrical elevation on the anterior wall was quite firm and was covered by an intact endometrium. On section through the compact uterine wall a pearly, opalescent area implanted directly into the surrounding opaque myometrium was encountered about 3 mm. beneath the mucosal surface. No definite cysts could be determined in this area, and it was indistinctly differentiated from its environs.

Microscopic analysis of the tumor tissue of the uterine wall showed a compact fibro-muscular structure in large whorls. Gland structures of varied size and shape were quite regularly and abundantly scattered through the tissue. Some of the cysts were elongated or stellate. In the greater number the lumina were empty, but occasionally there was contained in them a homogeneous material. Not infrequently the irregular stellate acini presented definite bulgings into the lumina, due to the projection of a slender shaft of stroma tissue. These papillae were almost invariably surmounted by a single layer of columnar epithelium and imparted a picture not dissimilar to that presented by an intracanalicular fibro-adenoma of the breast.

In the majority of instances the lining of the glands was of a tall, columnar-cell type fairly uniformly arranged and occasionally showing definite

cilia. The cell nuclei were, as a rule, quite large and vesicular. Nevertheless, in some instances, and particularly where the glands were most tortuous, the lining epithelium manifested a definite tendency toward proliferation or showed a papillary ingrowth into the lumen. At rare intervals mitotic figures were observed in the nuclei of the epithelial cells. In no instance did the mucosal cells violate their basement membrane or exhibit high invasive qualities. It is of interest to note that many gland structures were surrounded for varying widths by a more or less concentrically arranged stroma very like that seen about the normal endometrium, while the remaining glands, devoid of supporting stroma, were inserted directly between the muscle fasciculi. Nuclear figures were seen quite frequently in this stroma tissue. The sections displayed no evidence of an inflammatory reaction. The "flowing in" of the endometrium deep into the interstices between the muscular whorls was well demonstrated in the sections.

E. L. CORNELL, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Sampson, J. A.: Perforating Hæmorrhagic (Chocolate) Cysts of the Ovary: Their Importance and Especially Their Relation to Pelvic Adenomata of the Endometrial Type ("Adenomyoma" of the Uterus, Rectovaginal Septum, Sigmoid, etc.). *Arch. Surg.*, 1921, iii, 245.

In an article abundantly and excellently illustrated the author reports a short series of perforating hæmorrhagic cysts of the ovary. The lining of these cysts was low columnar epithelium, and in places, tubules and subepithelial tissue resembling endometrium which in some cases showed changes corresponding to, and synchronous with, the endometrium in menstruation. The contents of these cysts resembled old menstrual blood.

Most of the cysts varied in size from 2 to 4 cm., though the largest was 9 cm. They were unilateral or bilateral, singular or multiple, and they perforated or ruptured, their contents being discharged into pockets or folds of the peritoneum about the ovary or into the cul-de-sac. This bloody material caused irritation of the peritoneum and the formation of adhesions between the various organs in the pelvis.

Most of the cysts were found in women between the thirtieth year of age and the menopause. Few were found before and none after the climacteric. Generally the women were sterile or had been sterile for a number of years. Pain was the most frequent symptom caused by the adhesions. Some of the patients had dysmenorrhœa which increased with each period. There were no special physical findings, but nodules felt by rectal examination on the anterior rectal wall, beneath the mucosa, where the retroverted uterus was adherent, were very suggestive. Even at operation one is sometimes mistaken as to the true nature of the condition as the tumor and adhesions suggest malignancy.

In the adhesions were found epithelial structures like those in the cyst wall and about the site of perforation, i.e., glandular tubules and stroma resembling endometrium. The "implantations" were more frequent on the posterior wall of the uterus and the rectum, causing adhesions which obliterated the cul-de-sac. This glandular penetration was more extensive and deeper in the wall of the uterus than in other organs, the glands seeming to have a partial selective affinity for uterine musculature.

The cystic ovaries were found adherent to surrounding organs at the site of the perforation, which was observed to be on the lateral sides or the free border of the ovary. On separation of these adherent organs the perforation was reopened and more or less of the contents escaped. The extirpated ovary showed several rather characteristic features: the raw area about the site of the perforation, the contents resembling old menstrual blood, and the thickness of the walls which prevented collapse of the cyst after it was opened.

The author believes that these "implantations" or secondary "adenomata" with endometrial types of tissue are due to transplants of epithelial cells discharged in the "menstrual blood" or cyst contents at the time of rupture. The origin of the cyst in the ovary is unknown.

The treatment is essentially the establishment of the menopause and the removal of other organs or tissues which may be the cause of symptoms.

Twenty-three case reports are given.

R. E. CHRISTIE, M.D.

Eisenstaedter, D.: Carcinomatous Dermoid Cysts of the Ovary (Carcinomatoese Dermoidcysten des Ovariums). *Monatsschr. f. Geburtsh. u. Gynaek.*, 1921, liv, 360.

Carcinomatous dermoids are relatively rare. In the entire literature only about sixty cases have been reported.

Of 209 ovarian tumors operated upon from 1910 to 1920, thirteen were dermoids and three were carcinomatous dermoids. The latter were removed from patients 41, 38, and 54 years old, respectively, all of whom died after the operation. The author reports the histories and autopsy records of these three cases and describes the histologic findings in two. In one case a carcinomatous cystoma had invaded a dermoid. In the other case a dermoid had become invaded by a carcinoma which developed near it. The histologic findings in the third case could not be reported because the specimen was lost. According to the statistics reviewed, malignant degeneration of dermoids shows a frequency of 18.75 per cent.

VON LOBMEYER (Z).

Schumann, E. A.: Observations on Hæmorrhages of Ovarian and Tubal Origin Not Associated with Ectopic Pregnancy. *J. Am. M. Ass.*, 1921, lxxvii, 692.

Schumann states that ectopic gestation is so often the cause of acute abdomino-pelvic hæmorrhage that other causes are often overlooked.

There are three types of ovarian hæmorrhage: (1) interstitial, (2) follicular, and (3) intrafollicular. The author discusses these types in detail and gives the history of a typical case. He believes that the primary cause of the hæmorrhage is rupture of the follicular blood vessels due to a degenerative arteritis.

Trauma is usually the cause of tubal bleeding other than that due to extra-uterine pregnancy. The history of a typical case as observed by the author is given in full.

Schumann's conclusions may be summarized as follows:

1. A diagnosis of ectopic pregnancy should not be made definitely unless the embryo is identified or evidences of decidual or placental formation are found on microscopic examination.

2. When a massive hæmorrhage occurs from either ovary there is usually, if not always, a degenerative arteritis which causes the rupture of the blood vessels.

HARVEY B. MATTHEWS, M.D.

EXTERNAL GENITALIA

Villar, A.: Vesico-Vaginal Fistulæ (Sobre fistulas vesico-vaginales). *Rev. argent. de obst. y ginec.*, 1921, v, 133.

In one of the cases treated by the author in which the condition and situation of the fistula did not permit the use of the vaginal route he performed a laparotomy, and the ease of the operation so far exceeded his hopes that he came to the conclusion that all high fistulæ (those near or on the cervix uteri) or those difficult to operate upon by the vaginal route should be treated in this manner.

The point in the closure of the fistula to which special attention is directed is the suturing of the vesical plane with catgut and of the vaginal plane with non-absorbable material. Tincture of iodine should never be used for disinfection as it is injurious to the vaginal tissues. In some cases of extensive fistula in which the anterior or posterior uterine wall must be used in closing the tract the author prefers infolding of the wall to scarification. A gauze drain is never left in the vagina unless there is severe hæmorrhage. No postoperative vaginal lavage is used. A Petzer sound is placed in the bladder on the second day and withdrawn on the ninth or tenth day. Sexual relations must be prohibited for at least two months following the operation.

The author reports twelve cases. The operation was unsuccessful in only one and in this instance the failure was due to sexual intercourse.

W. A. BRENNAN.

MISCELLANEOUS

Bourne, A. W.: Gynecological Causes of the Acute Abdomen. *Practitioner*, 1921, cvii, 174.

The pelvic organs are often responsible for acute abdominal symptoms, thus making correct diagnosis and treatment difficult. Broadly speaking, all

acute symptoms may be classified in one of two groups: (1) the alimentary type, and (2) the genital type. However, as the abdomen and pelvis constitute one cavity, there cannot be a sharp distinction in signs and symptoms as at the outset a pelvic condition partakes of a genital character.

There is also a broad difference in the physical signs. For instance, an abdominal lesion with peritoneal irritation sets up a localized board-like rigidity, whereas an acute pelvic condition, especially in the deep recesses of the pelvic cavity, produces tenderness on deep pressure with some muscular defence, but no rigidity, such as is commonly seen in acute appendicitis.

However, in nearly every case of acute abdominal illness due to pelvic disease there are characteristic physical signs to be noted by vaginal examination. Pregnancy, especially if far advanced, may be an obstacle to a correct diagnosis by vaginal examination, and may be regarded as a direct cause of an acute abdomen, as in tubal gestation or the spontaneous rupture of a caesarean section scar. In regard to treatment, it may be said that acute gynecological conditions are rendered less urgent because of the tendency of inflammatory processes to be limited to the pelvic basin except in cases of ruptured abscesses or hæmorrhage.

With regard to classification the author states that the various conditions tend to fall into three main groups: (1) those due to infection, such as acute salpingitis; (2) those caused by internal hæmorrhage, such as ruptured pyosalpinx; and (3) accidents to tumors.

In cases of the first group by far the best results follow expectant treatment continued until the temperature and pain have subsided, operation being performed later if necessary.

In cases of the second group the urgency of operation is apparent in clear cases. In subacute cases the diagnosis is difficult because the condition resembles subacute salpingo-oöphoritis. In both, there is pelvic pain, tenderness of the hypogastrium, and the presence of a firm, tender, and fixed mass behind and to one side of the uterus. One point of difference is that in a case of recently ruptured ectopic pregnancy, for instance, the temperature is never raised, being normal or even subnormal, whereas in subacute salpingo-oöphoritis it is invariably raised. One condition requires operation; in the other delay is indicated.

Cases of the third group, of which the most common is torsion of the pedicle of an ovarian cyst, may be divided by examination into two clinical types. In the first type there is a very tender abdominal tumor, with rigidity and a rise of temperature and pulse. In the second type there is no abdominal tumor, but a slight swelling over the pelvic brim is noted on deep palpation. Such a tumor is generally a twisted dermoid cyst of the ovary.

On account of the gangrene which may follow strangulating torsion of the pedicle, laparotomy is

invariably indicated. "Red degeneration" of fibroids may produce acute and baffling symptoms. A previous innocuous fibroid suddenly becomes tender and painful and produces a rise in the temperature. Because of the pain, operation is usually resorted to, though it is questioned whether it is absolutely necessary. Any large necrosed tumor is dangerous, however, and should be removed. The majority of these pelvic cases are curiosities and have little practical importance, but the conditions described are commonly met with and frequently give rise to difficulties in diagnosis and treatment.

C. H. DAVIS, M.D.

Peterson, R.: The X-Ray After the Inflation of the Pelvic Cavity with Carbon Dioxide as an Aid to Obstetrical and Gynecological Diagnosis. *Surg., Gynec. & Obst.*, 1921, xxxiii, 154.

This method has been used by the author in over 150 cases. He has found that it is safe, practical, and of great aid in the accurate diagnosis of pelvic disorders, and that it has reduced the necessity for exploratory operations. Although the patient is caused some discomfort by the gas inflation, this may be reduced to a minimum by introducing the gas slowly and using the smallest amount necessary to obtain the information desired. Both the transuterine and transperitoneal routes of inflation were used although the latter was found to be preferable in by far the larger number of cases. In acute or subacute pelvic conditions the transuterine route is contra-indicated.

To insure successful pelvic roentgenography the patient must be placed so as to allow the gas to rise upward, displace the pelvic organs, and force the intestinal coils out of the pelvis. After many trials with different positions, the best results were secured with the moderate knee-chest position, an inclined board with a notch cut out for the tubes being placed beneath the thighs. The table was then tipped, as for the Trendelenburg position, the patient being prevented from slipping by shoulder straps. An 18-in. square of opaque fabric with a 6½-in. circular hole cut out of its center was laid on the buttocks to serve as a diaphragm. A plate-changing tunnel was then placed horizontally on the table, double screen films were employed, and a Coolidge portable unit operating in the ordinary lamp circuit furnished the roentgen ray. An exposure of from fourteen to twenty seconds was usually required.

In conclusion, the following summary is offered:

1. The uterus, together with the tubes and ovaries, can be clearly shown by pneumoperitoneal roentgenography.

2. Because of their distention with gas the tubes are rather more clearly demonstrated by the roentgen ray when inflation has been brought about through the transuterine route than when the inflation has been effected transperitoneally.

3. On account of the rapid absorption of carbon dioxide gas and the equally rapid subsidence of the discomfort produced by the inflation, this gas should

be used in preference to oxygen which is very slowly absorbed.

4. Irregularities of the uterus and omental and bowel adhesions are clearly demonstrated by the pneumoperitoneal roentgen ray.

5. In not a few instances the diseased and enlarged appendages are more clearly made out by pelvic roentgenography than by the most careful and searching bimanual examination, even when the latter is made under anæsthesia.

6. With the improved position (knee-chest and Trendelenburg) smaller quantities of gas are necessary for inflation. Thus discomfort is reduced to the minimum.

7. If the technique of pelvic roentgenography is good, the retention of bowel coils in the pelvis will be proof of the presence of adhesions.

8. The pneumoperitoneal roentgen ray is able to demonstrate pregnancy at a much earlier period than the examining finger.

9. With good technique and good judgment in the selection of cases both transuterine and transperitoneal gas inflation are free from danger.

10. Bimanual pelvic examination and pelvic pneumoperitoneal roentgenography are not antagon-

istic methods. Each is valuable and its value is increased if it is used to check the other.

ADOLPH HARTUNG, M.D.

Lacey, F. H.: **The Results of Vaginal Operations for Prolapse by the Manchester School.** *J. Obst. & Gynec. Brit. Emp.*, 1921, xxviii, 260.

The author reports the results of vaginal operations for prolapse of the uterus done in 1914, 1915, and 1916. Letters were sent to 750 of these patients who were operated upon by a number of surgeons, asking them the result of the operation, the number of their pregnancies and instrumental deliveries, and the effect of the latter. Five hundred and twenty-one replies were received. Four hundred and fifty-five patients (87 per cent) stated that they were cured. Of twenty-nine claiming that the operation had failed, re-examination showed that ten were cured.

A very high percentage of those bearing children had had instrumental deliveries. However, the number of cases in which there was recurrence of trouble was small. As the percentage of cure was so high, the author concludes that it is unnecessary to operate abdominally in uncomplicated prolapse or for perineal work.

R. E. CHRISTIE, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Shaw, H. N.: Pregnancy Following Implantation of the Outer End of the Only Remaining Fallopian Tube into the Uterine Cornu After Resection of a Cornual Pregnancy. *Bull. Johns Hopkins Hosp.*, 1921, xxxii, 305.

Briefly the case reported is as follows:

The patient, aged 36, was admitted to the Johns Hopkins Hospital October 3, 1919, complaining of irregular menstrual periods. Her last period had occurred in March. For seven weeks afterward there had been no bleeding at all. After this she had a period which lasted eight days and apparently had a regular period four weeks before her admission to the hospital. A few days before her admission, bleeding had reappeared and since that time had persisted irregularly.

The general picture suggested a left tubal pregnancy. At operation by Cullen, October 6, 1919, a tumor approximately 5 by 4 cm. in size which was present in the left uterine horn was found to be a cornual or interstitial pregnancy.

Cullen temporarily clamped the tube at its cornual attachment and drew it to one side. He then resected the uterine horn, leaving a raw area approximately 4 by 2 cm. at its uterine attachment, drew the fallopian tube into the uterine cornu so that its inner end lay in the cavity of the uterus, and approximated the wound. He then drew the excess of bladder peritoneum up over the raw area to prevent adhesions.

After the operation was completed the fimbriated end of the fallopian tube which lay free was about 1 cm. long. A cigarette drain was placed in the lower angle of the abdominal incision and the wound closed. The patient made a most satisfactory recovery and was discharged from the hospital October 23, 1919.

On December 28, 1920, the patient stated she was threatened with an abortion at two months. She was delivered prematurely at seven months because of placenta prævia. The child was born dead.

E. L. CORNELL, M.D.

Polak, J. O.: Observations on Ectopic Pregnancies. *Am. J. Obst. Gynec.*, 1921, ii, 280.

Polak believes that it is possible to make the diagnosis of ectopic pregnancy before the critical stage if proper attention is given to the history, symptoms, and physical signs. The majority of cases present a syndrome which is definitely characteristic and has a direct relation to the pathologic changes in the tube and the adjacent peritoneum.

He reviews 307 cases of ectopic gestation observed in the Long Island College Hospital, Jewish, Meth-

odist, Episcopal, and Williamsburg Hospitals in Brooklyn. Of this number three were full-term abdominal pregnancies due to rupture of tubal gestations occurring early in the course of the pregnancy and five terminated in the secondary rupture of an intraligamentous pregnancy at the third, fourth, and fifth months, respectively. In the remaining 299 cases rupture or abortion occurred before the twelfth week.

These anomalous pregnancies occurred in three distinct groups of patients:

1. In women with a previous history of a definite pelvic infection following marriage, intra-uterine instrumentation, abortion, or childbirth, or of an intra-abdominal operation followed by peritonitis with an intervening period of sterility which allowed sufficient time for the partial recuperation of the tubes. One hundred and eighty-six patients belonged to this group.

2. In women presenting a history of dysmenorrhœa from the first occurrence of their menstrual function; who on examination showed many developmental defects or hypoplasias, including funnel pelvis, infantile uterus, and narrow vagina; and who had remained sterile after marriage for varying periods and finally became pregnant following some procedure for the cure of their sterility. Such was the history of seven women who were subjects of repeated ectopic pregnancies. Ninety-four patients belonged to this group.

3. In women notably of Jewish, Irish, or Italian birth who had had repeated intra-uterine pregnancies ending in abortion or going to full term. In such cases the ectopic pregnancy cannot be accounted for. Twenty-seven women belonged to this group.

Cases without rupture and with but slight hæmorrhage into the decidua numbered thirty-nine. Tubal abortion or separation of the ovum from its decidual bed by bleeding into the decidua was recorded in 199 cases. Actual tubal rupture occurred only sixty-one times. In eighteen instances this occurred into the peritoneum with a varying amount of intra-abdominal hæmorrhage, or into the broad ligament with the formation of a varying-sized hæmatoma forty-three times.

The location of the ectopic gestation sac was found to be as follows: the interstitial portion of the tube, six cases, the isthmic portion of the tube, seventy-nine cases, the ampulla and free portion, 203 cases, the stump of a previously amputated tube, three cases, and an angulation of the tube caused by a previous Gilliam or Baldy-Webster operation, eight cases.

Clinically all ectopic pregnancies fall into one of two general classes: (1) those which may be classed as in the non-critical stage, with a distinctly

countable pulse of 100 or under, a systolic pressure of 100 or over, and a hæmoglobin content of 60 per cent or more (in this class there were 263 cases); and (2) those in the critical stage, pulseless at the wrist, with a blood pressure below 90, a hæmoglobin content under 50, and definite signs of internal hæmorrhage and collapse (in this class there were thirty-six cases).

The mortality was as follows: one death on the table from hæmorrhage; one death two hours after the operation from shock and hæmorrhage; and five deaths from peritonitis.

The following facts are evident from the history in the great majority of cases of unruptured pregnancy:

1. Ectopic pregnancy occurs most frequently when there is a congenital anomaly or a previous inflammation of the tube; in the woman who gives a history of premenstrual dysmenorrhœa.

2. There is either a period of amenorrhœa or an attempt at menstrual suppression but because of the unstable position of the ovum due to the imperfectly developed tubal decidua and erosion of the ovum into the underlying muscle and venous radicals, bleeding takes place into the decidua and produces ovular unrest such as to cause tubal distention and peristalsis which are evidenced by colicky pains and uterine bleeding.

3. The bleeding into the decidua plus the growing ovum distends the tube and causes the soreness and tenderness over the region of the distended gestation sac.

The relation of the physical signs to the pathology is still more striking and constant. The cervix is exquisitely sensitive to motion. The pulsation of the uterine artery is more apparent on the side of the gestation sac. The uterus is displaced because the tubal tumor has fallen into the lateral, the posterior, or the anterior cul-de-sac. The tumor is of rapid growth, exquisitely sensitive, and fluctuant.

Primary rupture or abortion generally occurs before the eighth week of pregnancy and is seldom attended by serious symptoms. There is usually an intervening period of several days, sometimes a week or more, before the rupture takes place. This was true in over 80 per cent of the tubal pregnancies under discussion. Therefore there is little excuse for not heeding the danger signs and for awaiting the critical stage with the signs of severe internal hæmorrhage.

Among gynecologists there is no diversity of opinion regarding the method of treating unruptured ectopic pregnancy. It is agreed that the tube should be removed by the abdominal route or emptied of its contents. In the critical stage the author waits until the reaction sets in. Less than 1 per cent of the patients bleed to death (three in the 307 cases in this series as the result of the primary rupture) as usually the erosion goes through an arterial twig and not the main vessel.

Almost all patients will improve following rest and the administration of morphine. Blood transfu-

sion is given preferably when the vessel has been tied, but in severe cases is indicated during the laparotomy.

E. L. CORNELL, M.D.

DiPalma, S.: Interstitial Tubal Pregnancy; A Report of Two Cases. *Surg., Gynec. & Obst.*, 1921, xxxiii, 285.

The author gives the history, pathologic report, and photomicrographs of sections of two cases of interstitial ectopic gestation.

Both cases were characterized by: (1) a previous history of abortion; (2) early rupture; (3) extensive intraperitoneal hæmorrhage; and (4) normal adnexa. From the photographs showing normal isthmal portions of the tubes and the record of previous abortions, the cause of the ectopic gestation may be ascribed to a low-grade inflammation of the uterus.

The author believes that the time of rupture and the amount of intraperitoneal hæmorrhage depend on the site of the implantation of the fertilized ovum and the relation of its chorion frondosum to nearby blood vessels. As the interstitial portion of the fallopian tube is about 1.5 cm. in length, attachment of the ovum may take place at the uterine end, at the isthmal end, or between these two points, depending on the extent of the previous damage to the tubal lumen. If implantation occurs near the uterine end, the possibility of an early abortion in the uterine cavity is apparent, while if it occurs at the isthmal end by the trophoblastic action of the chorion frondosum in an area of least resistance, rupture will take place generally into the peritoneal cavity but occasionally into the folds of the broad ligament, depending on whether the attachment of the ovum was on the upper or lower aspect of the tubal lumen. The hæmorrhage resulting from the erosion of the arterioles which are usually present at this location will be extensive. If implantation takes place between the uterine and isthmal ends, where the thickness of the musculature of the fundus and the uterine wall is considerable, it seems probable that, before rupturing, the pregnant sac would attain a larger size and the rupture would be attended by very extensive hæmorrhage from hypertrophied blood vessels, if these are involved.

C. H. DAVIS, M.D.

LABOR AND ITS COMPLICATIONS

Ebbinghaus, H.: A Bladder Stone as a Mechanical Hindrance to Birth (Blasenstein als mechanisches Geburtshindernis). *Zentralbl. f. Gynaek.*, 1921, xlv, 676.

Wishing to interrupt a second pregnancy at its outset, the author's patient introduced into the uterus the hard-rubber tube of a child's syringe. The point of the tube broke off in the bladder. The patient then suffered from bladder disturbances which were ascribed to the pregnancy. During labor the child's head became fixed in the small pelvis. The house physician discovered a very hard thickening behind the symphysis which he decided

was an osteoma. He sent the patient to the clinic where the object was thought to be a foreign body in the neck of the bladder. At operation, performed immediately, a bladder stone measuring 6 by 4.4 cm. and weighing 30 gm. was found. Immediately following closure of the bladder a 6-lb. child was born. The bladder stone had formed around the broken-off hard-rubber tube. A vesicovaginal fistula which had resulted was operated on successfully a short time later.

ZIMMERMANN (Z).

Beck, A. C.: The Two-Flap Low-Incision Cæsarean Section; An Operation Applicable After an Efficient Test of Labor. *Surg., Gynec. Obst.*, 1921, xxxiii, 290.

The technique described will eliminate the consideration of an elective cæsarean section in borderline cases of dystocia.

As the use of an efficient test of labor is permitted, most of these patients will be delivered through the natural passages. The few that fail may be delivered by the use of the technique described, with some slight added risk.

So-called potentially infected cases frequently are not infected. Whenever opinion in this respect is erroneous, the author's technique does not sacrifice a non-infected uterus and therefore preserves the functions of menstruation and reproduction.

While his results in the infected cases are better than may be anticipated in the larger series, they indicate that the mortality will be less than 10 per cent. As this is the admitted mortality of craniotomy as well as hysterectomy following cæsarean section in this class of cases, it would seem that the two-flap low-incision cæsarean section should be given the preference in all cases in which the child is alive.

Twenty-nine cases are reported. Four cases were elective cæsarean sections. In twenty-two cases one or more vaginal examinations were made. Eight patients had a temperature of 101 degrees or over. All of them recovered.

E. L. CORNELL, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Lang, E.: The Etiological Connection Between Conjunctivitis of the New-Born and Puerperal Mastitis (Zur Frage des ursächlichen Zusammenhangs zwischen Conjunctivitis neonatorum und Mastitis puerperarum). *Zentralbl. f. Gynaek.*, 1921, xlv, 750.

After a careful study of 455 wet nurses, the author comes to the conclusion that although there has been a marked increase in the number of cases of conjunctivitis in the new-born, there has been no increase in the cases of mastitis in wet nurses. An etiological connection between the two conditions, therefore, cannot be proved. Infection of the nursing breast by the nursing through a pus discharge of the eyes is possible, but gonorrhoeal mastitis has been found in only rare cases.

KALB (Z).

Potvin: Hysterectomy in Acute Puerperal Infection (De l'hystérectomie dans l'infection puerpérale aigue). *Gynec. et obst.*, 1921, iv, 207.

The advisability of performing a hysterectomy in acute postpartum or postabortion infection is a subject which has been much discussed by gynecologists and obstetricians in recent years. The importance of this procedure is based on: (1) the frequency of acute puerperal infection, which is about 10 per cent; (2) the difficulty in choosing any method of treatment; and (3) the gravity of the condition, the mortality of which ranges from 21 to 51 per cent.

Hysterectomy as a method of treating puerperal infection dates back only to 1886 when it was done for the first time by Schultz. The first report on its use in this condition was published by Wintrebert in 1895. D'Anvers performed it in purulent metritis following puerperal infection. Jacobs, Keiffer, and Rouffart came to the conclusion that when the infection has extended beyond the uterine mucosa and invaded the muscle there is a chance of recovery if the operation is performed before the infection becomes generalized.

The operation has its opponents. In 1903 Pinard at the Madrid Congress of Medicine stated that there is no rational indication for it in the treatment of puerperal infection. In Potvin's opinion, however, its indications in this condition are clear and precise. He believes it called for when it is necessary to stop the ascending progress of the infection at any cost. It is in reality the amputation of a gangrenous organ before its infecting products are thrown into the general circulation and should never be considered as an operation to be performed *in extremis* because under such circumstances it would only hasten death.

W. A. BRENNAN.

Cotte, G.: Hysterectomy in Acute Puerperal Infection (De l'hystérectomie dans l'infection puerpérale aigue). *Gynec. et obst.*, 1921, iv, 227.

In the acute types of septicæmia due to abortion, especially induced abortion, immediate hysterectomy should be done if there is danger that curettage might spread the infection. In other cases when the usual methods do not bring about any appreciable improvement the vaginal hysterectomy recommended by Faure is the method of choice.

Hysterectomy is indicated especially in those prolonged, acute types of septicæmia which so frequently result in death from secondary pyohæmia. When there are signs of severe infection with a tendency to the development of pyohæmia, repeated chills, etc., and when examination of the lochia shows colonies of streptococci, it is best to operate without delay, performing either a vaginal or an abdominal hysterectomy. The latter should be chosen when the presence of a phlebitis of the utero-ovarian veins is recognized and when the infection has passed the pelvis and become diffused toward the abdominal peritoneum, signs of peritoneal reaction being added.

W. A. BRENNAN.

MISCELLANEOUS

Holmes, R. W.: **The Fads and Fancies of Obstetrics; a Comment on the Pseudo-Scientific Trend of Modern Obstetrics.** *Am. J. Obst. & Gynec.*, 1921, ii, 225.

The author summarizes his article as follows:

Conservative treatment has caused a decrease in maternal and foetal mortality in private practice. The maternal and foetal death rates in hospitals have not shown an appreciable decline in one hundred years.

The fact that the death rate among the emergency cases (i.e., those sent in by medical attendants) is over ten times that of regular applicants in the New York Lying-In Hospital is a reflection on the preliminary medical training of the profession.

Scientific investigation of antenatal pathology which will promote a prophylactic therapy will lower infant mortality more than the present attempts to do so by the routine operative termination of labor.

A properly conducted prenatal clinic combined with conservative conduct of labor is more certain to secure a decrease in the death rates than promiscuous intervention.

Under normal conditions, spontaneous labor aided by proper analgesia is safest for both the mother and the child. Inordinately applied operative interferences increase the hazards of birth.

The authorities who have fostered a peculiar method of routine interference in all cases and those who imitate them have retarded the advance in

obstetrical care and are contributors to the high American mortality incident to childbirth.

It is lamentable that those who practice a routine intervention have a higher mortality than properly controlled midwives.

The proponents of operative cults have produced no evidence to show that their systems are more worthy and less risky, or that they promise a higher conservation of life than carefully watched spontaneous labor.

There are no more reasons why all parturient women should be delivered by operation than that all people should be inflicted with routine enemata or catheterization.

A medical fad should be discountenanced; precept and example founded on injudicious enthusiasm lead to many unwise procedures.

The indications for obstetrical operations demand revision; certainly they should be more clearly drawn, and limited rather than extended.

A wise conservatism in obstetrics will be more productive of ideal results than injudiciously used skill.

Obstetrical teaching is so deficient in most colleges that there should be decided and early improvement; as long as obstetrical teaching is defective obstetrical results in practice will be poor.

An obstetrical curriculum should be devoted to practical instruction on the manikin, in the class room, and in the clinic; obstetrical surgery should be a very small part of the coordinated whole. The proper place for the latter is in postgraduate courses.

E. L. CORNELL, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Geraghty, J. T., Short, J. T., and Schanz, R. F.: Multiple Renal Calculi, Unilateral and Bilateral: Some Observations. *J. Am. M. Ass.*, 1921, lxxvii, 901.

In this paper the authors discuss some of the problems associated with the proper management of cases of multiple unilateral or bilateral renal calculi located in the pelvis or cortex of the kidney.

Generally speaking, a large unilateral stone in the kidney or the ureter which cannot be passed should be removed unless there is some definite contra-indication to operative interference such as active pulmonary tuberculosis, advanced chronic nephritis, etc. If there are stones in both kidneys most urologists agree that as a rule the better kidney should be operated upon first. However, while the relative function of the two kidneys is usually the guide as to which should be attacked first, the position of the stone and the degree of obstruction it is causing will be the determining factors.

In the presence of multiple calculi scattered throughout the kidney substance the kidney should be left undisturbed, but if pain or infection are so severe as to demand interference a nephrectomy should be done. Nephrotomy is unsatisfactory on account of the danger of very severe early or delayed hæmorrhage; because it is attended by destruction of at least one-third of the secreting portion of the kidney in a clean case and of much more in the presence of infection; because of the probability of incomplete removal of multiple calculi; and finally because of the not uncommon persistent urinary fistulæ due to the dislodgment of small fragments of the stone at the time of the operation. In certain cases the authors advise the removal of these stones, especially when they may be reached by a pyelotomy or by several small nephrotomy incisions.

In some instances stones in the calyces may be released into the pelvis during pyelography and then may be readily removed by pyelotomy. In another group of cases in which the kidney is literally filled with calculi it is often only a shell and if the condition is unilateral the kidney should be removed. If the renal lesion is bilateral, as is frequently the case, its function is not often greatly improved by the removal of the stones. If a pyonephrosis then supervenes, a condition which usually results from impairment of drainage due to blocking of the ureter by a stone, ureterotomy may be necessary to remove such obstruction, but if it should be necessary to open the kidney, which is usually thin-walled, a rapid and complete removal of all the stones with drainage is frequently followed by

marked improvement of function. It is advisable in these cases to make a large incision in the mid-portion of the kidney and to pack around a large tube rather than to use sutures.

The stag-horn or branching calculus fills the pelvis and the calyces, and the roentgenogram resembles very closely a pyelogram. Such a stone usually produces few symptoms and is often discovered only by accident. As it can be removed only by complete nephrotomy, such a procedure is usually attended by more renal impairment than would be produced by the stone over a period of years. These kidneys should rarely be operated on; as a rule nephrectomy is the operation of choice.

In deciding on operation in any given case one is influenced by factors of immediate or remote importance. The development of an acute pyonephrosis, a complete ureteral block, or some other condition may require immediate interference. In other cases the possibility of preventing the development of future complications which may lead to renal destruction may justify the removal of the calculi. In any case one should carefully consider whether the removal of the calculi will cause greater renal destruction than will result from the presence of the stones. One should further consider whether the improvement in the kidney condition which will follow the removal of stones will justify the operative risk and whether the removal of all the calculi is feasible. A conservative attitude in the handling of many of these cases will be found to lead to better results as far as the patient's comfort and duration of life are concerned.

C. D. HOLMES, M.D.

Bryan, R. C.: Tuberculosis of the Kidney. *South. M. & S.*, 1921, lxxxiii, 355.

This article contains a description of the embryology and anatomy of the kidney, including its blood supply and lymphatic drainage. The author discusses also various pelvic deformities or anomalies, and anomalies of the blood vessels.

In Bryan's opinion, the etiology of tuberculosis of the kidney may be discussed under the following heads: (1) heredity; (2) trauma; (3) calculus; (4) mobility; (5) nephritis; (6) gonorrhœa; (7) infection; (8) malformation; (9) aberrant artery and vein, and (10) failure of complete rotation.

Bryan is of the opinion that the entrance of the tubercle bacilli into the kidney occurs by way of the blood stream, through the lymphatics, or directly. He calls attention to the lymphatic exchange of the epididymis, which ascends along with the spermatic cord, and suggests that possibly, therefore, an initial renal tuberculosis gives its first evidence as tuberculosis of the epididymis or vice versa. As the lymph flow is always from the kidney,

not toward it, the establishment of renal tuberculosis by this route is apparently a negligible factor.

Direct infection may occur from Pott's disease or tuberculosis of the lung, pleura, or liver, although the fatty bed surrounding the kidney and the dense kidney capsule seem to be a sufficient barrier to prevent such implantation. The most probable route of infection, in the author's opinion, is the blood stream.

Primary tuberculosis in the kidney is possible, but usually the infection is secondary to a focus elsewhere in the body. Tubercle bacilli may pass through a normal kidney without producing damage. Ultimately, by reason of congestion, the bacilli are arrested in the glomeruli and Bowman's capsule. The first pathologic response, cell proliferation, fatty degeneration, caseation, and liquefaction, is followed by the breaking through of the process from the papilla into the calyx. Neighboring papillae and remote parts of the kidney may become involved through the lymph channels. The author is of the opinion that the intertubular lymph spaces play an important part in spreading the infection between the pelvis and the cortex. By this means bacilli may be distributed along the cortex in areas remote from the primary lesion. Cortical invasion of the second kidney may be possible.

Bryan discusses the diagnosis in detail, including the cystoscopic findings and the use of pyelography when indicated.

The treatment of renal tuberculosis is both medical and surgical. Medical treatment includes dietetic and hygienic measures and vaccination.

The article is profusely illustrated with drawings, photographs, and pyelograms.

GILBERT J. THOMAS, M.D.

Bottaro, O. L. : Double Abdominal Ureteral Fixation (Urétero fijación abdominal doble). *Rev. argent. de obst. y ginec.*, 1921, v, 170.

A woman 38 years of age had a vesico-vaginal fistula which had destroyed all the fundus and the neck of the bladder and formed a cavity studded with calcareous deposits in which a fist could be inserted. This lesion was complicated by vulvo-vaginitis and a double colpocoele. Because of the impossibility of performing a direct operation, there being no vesical fundus, neck, or sphincter, it was decided by the author to employ an indirect method as was done by Castano in a similar case. Vertical incisions were made over the anterior iliac spines and the superficial layers and muscles were incised until the peritoneum was reached. The peritoneum was then turned back and the ureters, which were found resting on its posterior surface, were carefully isolated and their lower extremities fixed in the skin over the anterior iliac spines.

In the left side, which was the first operated upon, the wound became slightly infiltrated but this did not at any time endanger the ureteral fixation. Neither was there any ureteral infection. Following the operation on the right side the insertion of a prophylactic drain permitted closure of the wound

by first intention. The urine flowing through the two ureteral orifices is collected in rubber receptacles. A plastic operation on the vagina with extirpation of the bladder will be undertaken soon.

The author considers that any other site for the cutaneous openings of the ureters would be unsuitable because it would cause angulation.

W. A. BRENNAN.

BLADDER, URETHRA, AND PENIS

Mugniery, E. : The End-Results of the Maydl Operation for Extrophy of the Bladder (Résultats éloignés de l'opération de Maydl pour extrophie de la vessie). *Lyon chirurg.*, 1921, xviii, 481.

Nové-Josserand has operated upon five cases of extrophy of the bladder by the Maydl method. The first operation was done in 1899 and the last in 1920. Mugniery reviews the results.

There was one almost immediate death from peritonitis. The patient operated upon most recently had some renal infection but this has disappeared. The three other patients were operated upon twenty-two, seventeen and one-half, and twelve years ago respectively. All are in good health but two have slight nocturnal incontinence. The only disadvantage of the Maydl method is that, as compared with other methods, it is associated with a greater risk of postoperative pyelonephritis.

In 1904 the results in fifty-eight cases operated upon by the Maydl method were reviewed by Thobois. There were twelve postoperative deaths, seven of which were due to pyelonephritis, and six later deaths, four of which were due to pyelonephritis, one to cachexia, and one to some unknown cause. Of the forty survivors five had some renal irritation, four had nocturnal incontinence, and one had incontinence during the day. In the other cases urination occurred about every three or four hours.

A study of these results and those published since Thobois' report leads the author to conclude that in the Maydl operation the immediate mortality ranges from 26 to 30 per cent. The procedure is therefore a serious operation but it remains to be seen whether the Cunéo and Heitz-Boyer operations, the only others in use, are not more dangerous. In six cases in which the Heitz-Boyer method was used there were three deaths. In two of the others the result is good if the bladder is emptied every two hours or oftener, and in one case the result is poor.

The total results of the Maydl operation show that sixty-four patients out of ninety-eight have had good end-results. The danger of pyelonephritis has been exaggerated. The author believes that when this condition occurs it is due probably to ascending infection in the ureters which was present at the time of the operation. In the Heitz-Boyer operation the ends of the ureters can be sectioned.

In spite of its risk of secondary renal infection the fact that the Maydl operation gives good end-results in 60 per cent of the cases, that it is simple in

technique, and that it can be performed in one stage makes it of value in the cases of young persons who cannot withstand long operations.

W. A. BRENNAN.

Fedoroff, S. P.: Total Extirpation of the Urinary Bladder in Cases of Vesical Tumor (Ueber die totale Blasenextirpation bei Tumoren der Harnblase). *Manuscript*, Petrograd, 1921.

On the basis of 165 cases of tumors of the urinary bladder the author states that some pedunculated, histologically non-malignant papillomata become malignant and some histologically malignant tumors show no signs of recurrence five years after resection. He maintains that papillomata of the urinary bladder should be considered clinically as malignant growths. Their removal by means of the snare and electrocautery is not certain to prevent recurrence. The electrocoagulation method introduced in 1910 has a much more definite effect and is indicated for all pedunculated and other growths which the cystoscope shows have not penetrated the bladder wall. For diffuse, infiltrating bladder growths, large carcinomata and papillomata of the neck of the bladder, resection is necessary. In far advanced cases, however, total extirpation of the bladder is the method of choice. The high mortality of this operation reported by Jaeger (64 per cent), Petroff (50 per cent), and Bystroff (47 per cent) has not been confirmed by the author. On the contrary he states that in eleven cases of such extirpation in the Fedoroff clinic not a single death occurred which could be attributed directly to the operation.

Fedoroff reports five cases of his own. The first was that of a 39-year-old man who had been treated by different physicians for a tumor of the urinary bladder over a period of twenty years. The papilloma had been removed several times but every operation was followed by recurrence. Finally, Fedoroff performed a complete extirpation of the bladder. The patient died from metastasis five years after the operation.

The second case was that of a 45-year-old woman with the history of a vesical tumor for thirteen years. After repeated removals of the growth she consented to total extirpation of the bladder. The ureters were implanted in the flexure of the colon. Six years after the operation she was still in excellent condition. The urine was passed per rectum eight to ten times daily.

The third case was that of a 59-year-old man who had had a papilloma removed several times. Histologic examination showed the growth to be a carcinoma. The author performed a total extirpation of the bladder and implanted the ureters into the flexure of the colon. Much infiltration of the growth in the surrounding tissues made the operation difficult. Death occurred a year and four months after the operation.

The fourth case was that of a 53-year-old man. After resection and thermocauterization a fistula remained. The diagnosis was carcinoma. After two

months the ureters were implanted in the flexure of the colon. The cancer had grown through the bladder wall and formed metastases. The patient died six days later from pneumonia.

The fifth case was that of a 56-year-old man with carcinoma of the anterior and left side of the bladder wall. The ureters were implanted in the sigmoid flexure of the colon. One month later total extirpation of the bladder was done. Death occurred twenty days later from an ascending pyelonephritis.

The author maintains that total extirpation of the bladder gives good results even in the cases of old persons. Implantation of the ureters in the flexure of the colon gives a good functional result. Implantation of the ureters into the skin is to be abandoned because of the unfavorable and disagreeable after-results. Lumbar ureterostomy or nephrostomy or the implantation of the ureters into the vagina or rectum may be done. Implantation into the vagina leads to a constant dribbling of urine. Implantation into the rectum is technically more difficult. The patient urinates eight to twelve times a day through the rectum and there is danger of an ascending pyelonephritis. The author greatly prefers implantation into the flexure of the colon. In implanting the ureter and suturing it into the flexure it is important to see that it is not under too great tension and is not kinked. In women the entire urethra must be removed to prevent metastasis. To obtain better access to the bladder the author makes a transverse incision severing the insertions of the muscles at the symphysis in addition to the incision in the median line of the abdomen. In the male it is then possible, if necessary, to remove the prostate and seminal vesicles.

Fedoroff warns against symphyseotomy or temporary resection of the pubic bone as such procedures help little and cause severe wound complications. In the case of males he drains through the anterior abdominal wall and is satisfied with that method. In the case of females drainage must be effected through the vagina.

The author believes that after a surgeon has once done the transperitoneal bladder resection he will never go back to the extraperitoneal method. The only contra-indication to the use of this route is a tumor growth involving the anterior abdominal wall and peritoneal infection.

Malignant tumors of the bladder remain localized for a long time and form metastases relatively late. The lymphatic channels related to the urinary bladder have not been definitely traced. Clinical experience shows that the lymph glands first become involved when the neighboring organs have become invaded. In the author's cases there was no lymph gland involvement. Recurrence took place from the original growth or the bed of the growth in the bladder or extended along the mucous membrane. Hence it is important to destroy any mucous membrane which may become affected. The earlier and the more radical the operation the less the danger of recurrence.

HESSE (Z).

Scholl, A. J., Jr.: Squamous-Cell Carcinoma of the Urinary Bladder. *Arch. Surg.*, 1921, iii, 336.

Trauma and infection not infrequently cause the mucosa of the urinary tract to undergo epidermization. These plaques of abnormal epithelium may persist for many years and have a tendency to undergo malignant changes.

The majority of squamous-cell carcinomata of the bladder are flat and ulcerated, extensively involving the wall. The pre-operative symptoms usually are of short duration and mild. Metastasis occurs, but not so frequently or so extensively as the extent and appearance of the local lesion would indicate. Mitotic figures are fairly common in epidermoid tumors of the bladder, but do not always indicate a high degree of malignancy as they are not so important a criterion of malignancy in epitheliomata as in connective-tissue tumors.

Six cases of squamous-cell epithelioma were seen at the Mayo Clinic between January 1, 1910, and January 1, 1920. These cases are of interest not only because of their extreme malignancy, but also because of the insidious onset of the condition and the absence of definite symptoms. The growths are readily recognized histologically, a fact of distinct prognostic importance.

Three of the six patients examined were in an operable condition on an average of three months after the first appearance of symptoms. One of these had a recurrence four months after the operation and died eight months later; one died six months after the operation; and one, the only patient who did not die from the disease, is living and well nine years after the operation. The other three patients had inoperable tumors with symptoms referable to the carcinoma for an average of twelve months.

Two of the six patients had undoubted cystitis for more than twenty-eight years, while in one the tumor was complicated by stone formation.

The average age of the patients was 46 years, which is lower than the average age of those with carcinoma of the bladder. The incidence of sex, four women and two men, is also exceptional as usually the males outnumber the females three or four to one.

A. C. JOHNSON, M.D.

Jacobs, L. C.: Manifestations of Lesions in the Posterior Urethra. *California State J. M.*, 1921, xix, 370.

Jacobs gives twelve case histories and shows some excellent photographs of wax models of the lesions as they appear on cystoscopic examination.

The two most important types of lesions with symptoms referable to the posterior urethra are chronic urethritis with prostatitis and those of the so-called sexual neuroses. The sexually neurotic type of patient is one who deserves the greatest consideration; such persons suffer mental anguish and attach great importance to their symptoms. They should be given a cysto-urethroscopic examination because most of them show pathology in the

posterior urethra which is particularly amenable to treatment. The therapeutic results obtained in the majority of these cases by the use of the fulgurating current are very satisfactory.

LOUIS GROSS, M.D.

GENITAL ORGANS

Strominger, L.: Considerations Regarding the Pathogenesis and Treatment of Prostatic Hypertrophy (Quelques considérations sur la pathogénie et le traitement de l'hypertrophie prostatique). *J. d'urol. méd. et chir.*, 1921, xii, 81.

A consideration of many clinical and anatomical facts leads to two conclusions with reference to hypertrophy of the prostate: first, that prostatic inflammation in some manner prevents the development of a true glandular hypertrophy, and second, that prostatic hypertrophy is not a disease localized to the prostate.

The author believes there is an important relationship between arteriosclerosis, prostatic hypertrophy, and the genital functions. Remlinger, Director of the Pasteur Institute at Constantinople, found many evidences of arteriosclerosis in patients sexually continent. The author offers these observations in conjunction with the occurrence of prostatic hypertrophy in sexual continents and others whose sex life is irreproachable, but who have evidences of arteriosclerosis. The explanation is offered that vascular changes produced by some general intoxication and resulting in arteriosclerosis are the factors directly responsible for prostatic hypertrophy.

Further proof of this relationship is given by the work of Castaigne and Lavenant who found that chronic nephritis becomes ameliorated following prostatectomy. The author furthers the view of Albarran that urinary retention is due to a genito-vesical inhibition produced by an internal secretion of the hypertrophied gland. This same hypothetical secretion is consequently supposed to be the cause of a generalized vascular tension which certain investigators have found to disappear following removal of the prostate.

LOYAL E. DAVIS, M.D.

Hunt, V. C.: Surgery of the Prostate. *Minnesota Med.*, 1921, iv, 541.

Not more than one-half of the persons with diseases of the prostate require surgical treatment. The non-surgical group is composed of those with acute and chronic prostatitis complicating and following acute specific urethritis. In a review of 856 prostatectomies it was found that fifty glands were of the chronic fibrous type without adenomatous hypertrophy; forty-eight specimens showed prostatitis as the primary condition with a few small adenomata; and fifty-six evidenced marked prostatitis with associated primary adenomatous hypertrophy. Chronic prostatitis may produce all the symptoms of adenomatous hypertrophy, such as frequency, difficulty, and incomplete emptying of the bladder,

with residual urine, and even at times acute retention. This type of gland, distinguished by fibrous tissue formation, is evidence of the prominent rôle played by infection in the etiology of late prostatic disease.¹

Prostatic abscess is of relatively slight surgical importance because as a rule it complicates the acute prostatitis of venereal origin and ruptures spontaneously into the urethra.

Carcinoma of the prostate is found in 15 per cent of persons with symptoms of prostatic obstruction. In the great majority of cases surgery is contra-indicated because of involvement of adjacent viscera or distant metastasis. In an analysis of 362 cases of carcinoma of the prostate observed in the Mayo Clinic Bumpus found remote metastasis in 21.8 per cent, and in a later series metastasis was noted in 30.3 per cent of 135 cases. The pelvis, spine, and femur were the bones most frequently involved. Surgery in this type of case is not beneficial except insofar as palliative measures for the relief of obstruction are indicated.

Benign adenomatous hypertrophy is the most common surgical lesion of the prostate. It occurs most frequently late in life, 83 per cent of the cases occurring in the sixth and seventh decades.

The gland which produces symptoms is not necessarily large. Obstruction and retention are the factors directing attention to it, and the "silent" prostate may be a huge intra-urethral and intra-vesical growth.

A large prostate unproductive of symptoms does not require surgical treatment, but when, irrespective of its size, it is responsible for frequency or difficulty in micturition, pain, hæmaturia, and residual urine, operation is indicated in the absence of general contra-indications. The obstructing prostate reflects its pathologic condition on the upper urinary tract and the general condition. The pre-operative stage is therefore the most important in the treatment of these patients who must be considered as potentially, if not actually, uræmic. Renal function is diminished because of infection and back pressure on the kidneys, the bladder is often a septic pocket because of infected residual urine, and the blood-urea nitrogen is markedly increased. The preliminary treatment is directed toward the relief of these conditions and the most important step is proper drainage of the bladder. The author cautions against rapid drainage of the residual urine and emphasizes the desirability of gradual decompression of the bladder by the Van Zwalenburg method. The more severe cases demand suprapubic drainage; approximately 25 per cent of the patients have less than 2 oz. of residual urine and no renal insufficiency, and can be subjected to prostatectomy without preliminary treatment. About 50 per cent must be prepared for prostatectomy by the use of a permanent urethral catheter.

Van Zwalenburg's method of gradually decompressing the bladder has increased the percentage

of cases in which a one-stage prostatectomy can be performed with safety. At the Mayo Clinic the one-stage suprapubic operation following preliminary gradual decompression of the bladder is preferred.

The chief advantages of the one-stage operation are that the operative field is in full view, hæmorrhage is more easily controlled, associated lesions, such as stones and diverticula can be dealt with, infection is less frequently a complication, and convalescence is shorter.

Spinal anæsthesia induced by the method of Labat, or combined transsacral and abdominal infiltration with novocaine, has been used in all prostatic operations for the past six months. The range of operability is thereby extended and the time element in the operation decreased.

Technical points in the one-stage operation emphasized are: (1) careful suturing of the bladder neck, which is the source of most of the bleeding, (2) control of the bleeding from the interior of the prostatic capsule, and (3) accurate closure of the bladder. The Pilcher bag is successfully used in the Mayo Clinic. All suprapubic tubes are removed on the day following operation, a urethral catheter being inserted. The suprapubic wound usually heals by first intention and there is no urinary drainage after the removal of the bag.

A reduction in the mortality rate during the past few years has been due to: (1) the recognition of the fact that these patients are potentially uræmic and require preliminary treatment before operation, (2) improved technique in the operation, and (3) the elimination of ether as an anæsthetic.

Ninety-four and five-tenths per cent of 614 patients report that they are cured or markedly improved.

V. G. BURDEN, M.D.

Bugbee, H. G.: Prostatectomy in Bad Surgical Risks. *J. Am. M. Ass.*, 1921, lxxvii, 905.

The author outlines his pre-operative treatment of cases of grave prostatic obstruction associated with marked cardio-renal disease, his method of operating, and the postoperative management. He states that old age as a contra-indication to operation has probably been over-estimated and that even in the presence of advanced cardiac and renal complications prostatectomy may be carried out with success if performed in several stages. Careful attention should be given to the patient's general condition. If hæmorrhage is avoided at the time of the enucleation, much of the shock and renal insufficiency will be prevented.

The present step-by-step technique of prostatectomy has removed many of the contra-indications to this operation. While only a few years ago speed of operation was regarded as the most important factor in the successful treatment of this condition, we know now that this is not logical and that the time necessary for its relief will be more or less in proportion to the time involved in the culmination of the pathologic process in the final condition.

In the pre-operative management of this type of case the first consideration is the prevention of absorption from the bladder, the relief of the kidneys, and the promotion of elimination in other systems. Drainage of the bladder will relieve the kidneys and prevent absorption, but if this is done rapidly either by complete catheterization at once or by cystotomy uræmia may supervene. When the patient is carrying over 6 oz. of urine the bladder should never be emptied at once unless it is accustomed to being catheterized; a greatly over-distended bladder should be emptied gradually over a period of two weeks. A catheter may be fastened in the urethra and should be retained in position until the patient shows no signs of uræmia, when suprapubic cystotomy may be safely done.

It is entirely possible to establish gradual suprapubic drainage under local anæsthesia by carefully inserting the Pezzer catheter stretched over an introducer into a very small incision in the bladder. A suture on either side of the catheter in the bladder wall insures tight closure, and a clamp on the tube will allow the urine to escape as desired. During this time a great deal can be accomplished by forcing fluids by mouth and rectum, and by promoting free elimination by the intestinal tract. The patient should be kept out of bed as much as possible.

As a high blood pressure is preferable to a low one—fluctuations of pressure being indications of circulation and renal condition—the administration of gum glucose may aid in its stabilization. While renal function tests are important, they are of value chiefly because they show when a new level has been established which shows little variation. If the patient then takes and assimilates a sufficient quantity of food and has a moist clean tongue, the prostate may be enucleated. Except when the patient is fat, the enucleation may be readily executed through the suprapubic cystotomy sinus under gas-oxygen anæsthesia with one finger when the prostate is lifted up from below by an assistant's finger in the rectum. The Pilcher bag is then drawn into position and filled with water, and slight traction is maintained. Loose packing is placed around the bag and the end of the packing is carried out through the sinus which is closed by one silkworm-gut suture. The next day one strip of packing and the bag are removed and a mushroom catheter is inserted into the suprapubic sinus. The scrotum is elevated and the bladder is not irrigated. The fluid in-take is kept high, and the bowels free. The patient is gotten up in a chair as soon as he feels equal to it, which is often the following day. The Pezzer catheter is left in for about eight days, at the end of which time a soft rubber catheter is fixed in the urethra and retained in position while the suprapubic sinus is packed down to the bladder wall and allowed to heal. Healing usually requires about three weeks.

The author reports nine cases of marked prostatic obstruction complicated by marked renal and circu-

latory disease in patients whose ages ranged from 68 to 90 years. These cases were successfully managed by the methods discussed.

C. D. HOLMES, M.D.

Rubritius, H.: The Two-Stage Prostatectomy (Zur zweizeitigen Prostatektomie). *Ztschr. f. urol. Chir.*, 1921, vii, 109.

After discussing the history of the two-stage prostatectomy and emphasizing the services of Kuemmell in introducing it, the author states that this method has been adopted because the results of the single stage operation have not been satisfactory and because by this technique we are able to give relief in a much larger number of cases, including those in which the second part of the operation is not performed. For example, the poor kidney function, insufficiency, and infection can be relieved much better by cystostomy than by the use of a permanent catheter.

Of forty-two patients operated upon eleven were treated by the two-stage procedure. With one exception these patients were in the seventh and eighth decades of life. Half of them had severe retention, hæmaturia, and poor function. Function was tested by the Voltevlus water test and indigo-carmin. Elimination and concentration improved after the first part of the operation. The intervals between the first and second stages ranged from thirteen days to six months. Two carcinomata were cured.

Among the patients operated upon by the two-stage method there were two deaths. A 72-year-old patient who had recovered very well after the first operation died a day after the prostatectomy. The interval between the two stages was too short. A 73-year-old patient died from peritonitis, the peritoneum having been torn in several places in the technically difficult prostatectomy. The latter case demonstrates that in preparing the operative field in the first operation we should push the peritoneum up. Therefore, the formation of a fistula with a trocar should be abandoned.

The technique recommended is that ordinarily used. In the first procedure a tube should be introduced into the fistula and after six to eight days a Petzer catheter should be placed in the bladder. The use of a permanent catheter is contra-indicated. The second stage performed under lumbar infiltration or ether anæsthesia is generally well tolerated if the first stage has been borne well. Cystostomy has greatly extended the indications for the operation.

ROEDELIVS (Z).

MacGowan, G.: The D'Arsonval Method of Coagulation Necrosis for the Removal of Immense Intravesical Outgrowths of the Prostate, Simple or Malignant. *California State J. M.*, 1921, xix, 351.

MacGowan says that the bipolar current is practically a bloodless and safe procedure so long as the end of the electrode is not thrust through the tissues

that lie outside of the bladder walls toward the rectum or the peritoneal cavity. His method is as follows:

The tissues are desiccated and as the desiccation increases the tissues are snipped away with scissors until the margin of destruction is approached, as evidenced by the ability of the vessels to seep a little bloody serum. When the process extends into the walls of the bladder everything that appears to be involved in the growth is desiccated, and as it is desiccated it is removed with the curette until all of the hardened infiltrated portions of the bladder wall marking the site of the tumor have become flexible to the finger and all the blood vessels of supply have been destroyed by the current. If the line of direction of the growth is toward the rectum, the gloved finger of an assistant is kept in this cavity to give timely warning of too close approach to the gut, evidenced by a considerable degree of heat which precedes the advancing point of the electrode.

If the growth has sprung from the prostate, the electrode is thrust into the capsule of the prostate on either side and these tissues are also coagulated after all of the intravesical portion has been removed. It is not necessary, according to the author, to proceed to the extent of absolute destruction as in the treatment of cancer of the bladder or a cancerous growth springing from the prostate unless it is very evident to the sense of touch that the growth is malignant. In the latter case it should be loosened up after the plane of cleavage is found, and gradually enucleated, and as the tissues are cooked, the capsule should be thoroughly treated with the spark, with all the outlying structures that seem to be involved in the malignant growth.

In cases of malignancy further certainty of cure is acquired by introducing within the capsule of the prostate a suitable quantity of radium and leaving it there a proper length of time after the removal of the prostatic tumors.

The author reports five cases and states that a successful result could probably have been obtained by any other method in only one of them.

LOUIS GROSS, M.D.

Walker, J. W. T.: Open Prostatectomy. *Brit. M. J.*, 1921, ii, 311.

In reviewing the results of the operation of prostatectomy as generally practiced the author was struck by the fact that the three main complications and sequelæ, hæmorrhage, infection, and postoperative obstruction, are due chiefly to the completion of the operation without proper exposure. Walker advocates and describes an open operation which aims at placing prostatectomy on a higher plane in the scale of surgical procedures.

Although death ascribed to hæmorrhage following prostatectomy is rare, it is undoubtedly true that hæmorrhage plays a large part and is often the deciding factor in deaths attributed to shock, collapse, renal failure, etc. Control of hæmorrhage is much

more certain when proper exposure is obtained than in the blind operation.

Infection generally occurs after prostatectomy, but its severity can be greatly reduced and its more serious sequelæ rendered less frequent by the removal at operation of tags and pieces of tissue which, if left, would slough.

Obstruction occurs almost entirely at the internal meatus where the bladder joins the cavity remaining after the removal of the prostate. This sequela may be effectually prevented by excising the folds and strips of mucous membrane and a portion of the semilunar fold formed by the trigone at the posterior lip of the orifice.

The prostate is enucleated in the usual manner with the gloved forefinger of the right hand and generally without the assistance of a finger in the rectum. The patient should be in the horizontal position. A suture is then inserted in the bladder wound at each side, the patient is placed in the Trendelenburg position, and the author's retractor is introduced. This instrument allows excellent exposure. By clipping away loose tissue, the prostatic cavity is cleared of débris. A wedge-shaped section caught up by pressure forceps is removed from the posterior crescentic ledge, and sutures are introduced and tied external to the forceps. An oval opening is thus left which forms part of the bladder.

It is unnecessary either to preserve the strip of urethral mucosa which may remain posteriorly or to attempt to suture the urethral mucosa to the mucosa of the bladder. Such a tube deprived of its blood supply is a menace. Hæmorrhage is best controlled by suture under the lip of the vesico-prostatic opening and by packing. The bladder blades of the retractor are now replaced by abdominal blades and, after the frame has been turned toward the feet, the abdominal wound is repaired. A drain is left in the prevesical space.

The duration of the open operation is slightly longer than that of the blind operation but time spent in the latter on irrigation to control hæmorrhage is better employed in exposing and controlling the bleeding points. Hernia is no more apt to develop following the use of the long incision efficiently closed than following the buttonhole incision.

J. W. ROSS, M.D.

Lombard, P., and Béguet, M.: Suppurative Orchitis Due to the Micrococcus Melitensis (Orchite suppurée due au micrococcus melitensis). *Presse méd.*, Par., 1921, xxix, 753.

Genital complications are present in about 5 or 6 per cent of cases of Malta fever. Sometimes they occur during convalescence, becoming suddenly manifested by a sharp pain in one side of the scrotum. The rapid swelling following is due to tumefaction of the testicle or of the testicle and epididymis. The pain diminishes at the end of six to eight days. In a few weeks, often less, the swelling disappears and the orchitis is ended. Recurrence, however, is possible. In exceptional cases there is

suppuration. The micrococcus melitensis is not necessarily pyogenous and a testicular abscess due to it is very rare. The authors know of only four cases, one of their own and three reported in the literature. Their own case was that of a man 56 years of age who gave a history of malaria and dysentery and a recent attack of fever followed by swelling of the right testicle to the size of an orange. Castration was done. The testicular pus showed the micrococcus melitensis in pure culture.

Orchitis associated with Malta fever arises from a blood infection. It involves both the glandular structures and the tunica vaginalis. In the gland the suppuration has multiple foci; the tunica vaginalis in its vicinity reacts early and becomes filled with a liquid which at first is serous and then purulent,

the change being due to rupture of the intra-glandular collections into the serous liquid. Clinically the process may appear as an acute, subacute, or chronic vaginalitis. The case reported in this article belonged to the subacute variety.

In the authors' opinion the seriousness of suppurative orchitis following Malta fever is dependent upon the number of the purulent foci. The gland may be honeycombed with abscesses causing destruction of the greater part or all of it. In such cases there can be no thought of preserving the gland and castration is indicated. Possibly if the true nature of the condition could be diagnosed very early the gland might be saved. The authors suggest also that serotherapy or vaccinoththerapy might prove of value.

W. A. BRENNAN.

SURGERY OF THE EYE AND EAR

EYE

Van Duyse, G. M.: Colobomatous Microphthalmos with a Retropalpebral Orbital Cyst (Microphthalmos colobomateux avec kyste orbitaire rétro-palpebral). *Arch. méd. belges*, 1921, LXXIV, 593.

The author's study was made on a dolichocephalic hydrocephalic foetus with cheilognathopalatoschisis, sexdigitism, and pes equinus. The two ocular bulbs presented the same anomalies but they were somewhat more accentuated on the left side. On the right there was acorea, and an epithelial lamina of the iris extended backward. On the left there was entropion due to duplication. There were four nuclear arcs in one cataractous lens but on the congener lens these had been rendered indistinct by degeneration of the fibers causing liquefaction of the cortical layers.

The retina, which was well developed in the right eye, appeared in the left in the form of a horse-shoe open behind, the retinal lamellæ ending here as an amputation cone. In this spot there was a space between the intrabulbar retina and the intracystic retina the continuity of which was perfectly preserved in the right eye. The bulbar cavity led into the cystic cavity by a wide neck on the right side and by a sinuous neck on the left. This was because an intercalary tissue has caused a deviation of the retina which passed into the cyst while separating it from its distal intrabulbar segment as it had separated the pigmented lamina in partially transforming it into epithelial cysts.

In addition to this peculiarity which modified the anatomical topography of the left eye as compared with the right, the pigmented lamina of the eye crossed the neck of the cyst followed by a stratum of cylindrical cells which in turn was succeeded by an insufficiently differentiated inverted retina lining the entire inner wall of the cyst. These were derived from the temporal side of the orbit, the small eye remaining pushed back on the nasal side. One of the segments formed a pocket behind the upper eyelid. The cystic covering, which is a continuation of the pigmented epithelium—cylindrical retina and inverted rudimentary retina—corresponded to the external lamina of the duplication of von Hippel, to the folded lamina of the optic part, metamorphosed, simplified, and remaining in the primitive state.

The intrabulbar retina was herniated, becoming ectropionated in order to advance in the embryonic mesodermic tissue by the force of its normal development alone. The small size of the bulbar cavity caused a "retinocele." The eventual presence of a subretinal fluid favored the cystic development caused by the retinal hernia.

In the interior of the cyst two central segments of retina were found which were separated by an axis of the vitreous body and hyaloid vessels with their internal limits toward these and their external limit toward the cystic cavity.

The inverted retinal lamina covered the internal wall of the cystic diverticula sometimes in the form of a poorly differentiated retina with a stratum of single cells turned toward the cystic cavity and an inner glial stratum adjacent to a hyalinized mesoderm, and sometimes in the form of strata of cylindrical elements. In the neighboring cystic parts of the eye there were layers of pigmented epithelium. This segment of retinal lining passed into glial hyperplasia, to localized gliosis which may be compared to the atypical proliferation of Friedlander. A marked peculiarity was the formation of buds and dermo-epithelial villousities in the region of the pigmented epithelium of the cyst.

Von Hippel has spoken of a cystic formation containing four laminae: the inverted peripheral laminae of the retina and the internal laminae with strata arranged normally. According to Natanson, no case is known in which the inner lining of the cyst was found so constituted. Van Duyse, however, in 1900 reported this finding in a brother of the subject whose case is reported in this article. The type of malformation described by the author is summarized briefly as follows:

The retina of the secondary ocular vesicle not finding sufficient space in the ocular cavity, extended backward and downward and became duplicated. The non-inverted portion ended normally at the optic nerve. The non-inverted part, the external lamina of the retinal duplication, became united to the surrounding mesoderm and continuous with the pigmented epithelium which remained forcibly separated from the optic nerve. The folds of the pigmented epithelial lamina, like those of the internal lamina of the secondary optic vesicle, may have become detached, isolated, and transformed into cysts, or the cavity of the orbital cyst may always have communicated with the subretinal space of the eye.

This article, a complete study of colobomatous microphthalmos, is supplemented by a number of histologic plates.

W. A. BRENNAN.

Ziegler, S. L.: The Ocular Menace of Wood Alcohol Poisoning. *Brit. J. Ophthalm.*, 1921, V, 411.

Ziegler concludes after a critical study of the phenomena occurring in cases of wood alcohol poisoning that the primary and fundamental lesion is a profound injury of the pituitary body. The changing but steadily contracting fields, the fugitive scotomata, the visual loss and recovery, the scler-

osed or atrophic nerve heads, the fixed and dilated pupils, the temporary paresis of the extra-ocular muscles, the ptosis, the ataxic gait, and the mental hebetude are all characteristic of such involvement.

Methyl alcohol is the most deadly poison used in daily commerce; one teaspoonful has caused blindness and one ounce has caused death. It may enter the body through the mouth, the nose, or the skin. It is a protoplasmic poison possessing a selective affinity for the delicate nerve tissues of the eye. Its biochemistry is modified by oxidation, first to formaldehyde and then to formic acid, both of which are corrosive poisons; formic acid is the end product excreted by the kidneys.

Sudden blindness with vomiting and abdominal pain, especially if associated with diplopia or ptosis, should always arouse suspicion of methylic poisoning; papillitis, sector-like atrophy, and sudden sclerosis of the nerve head are equally typical fundus lesions; contracted fields and central or paracentral scotomata are usually present. Van Slyke's test will reveal acidosis in the early stages and alkalosis later.

The treatment should include early neutralization by alkalis to lessen the destruction of nervous tissue, and elimination by lavage, emetics, diaphoretics, purgatives, and rapid oxidation. Lavage should be repeated because much of the wood alcohol in the system is returned to the stomach.

To revascularize the disc and restore the lost function of the nerve no measure can equal the stimulating effects of negative galvanism; this should be administered with great care, with a high voltage and low amperage. Sixty volts should be passed through the main shunt controller, with the amperage reduced to 1 mm. by a secondary carbon controller. The current should be passed for ten minutes, and then reduced to $\frac{1}{2}$ mm. and passed for a second period of ten minutes. These séances should be continued on alternate days. This is the most efficient therapeutic measure known for the milder cases of toxic injury in which there has not been complete destruction of the nerve fibers. If the nerve fibers have been completely destroyed, galvanism will have no effect whatever.

Six cases are reported with the results of treatment.

C. CORBIN YANCEY, M.D.

Sirlin, G.: Corneal Ulcer and Hypopyon Cured by Milk Injections (Úlcera de la córnea e hipopión curada con las inyecciones de leche). *Semana méd.*, 1921, xxviii, 434.

A diagnosis of corneal ulcer complicated by hypopyon and iritis was made in the case of a woman 45 years of age. As treatment by the usual methods did not result in any visible improvement, the author determined to try muscular injections of cow's milk four or five hours old. Ten cubic centimeters were injected into the buttocks. The effect was so rapid and decided that by the following day the pain in the eye, the blepharospasm, and the

photophobia had diminished and the vision was more acute. One injection a day was given for three days. The hypopyon has now been resorbed, the iris has recovered its normal appearance, and the patient has no further symptoms. W. A. BRENNAN.

Rose, S. G.: Nutritional Keratomalacia in Infants, with a Report of Four Cases. *Am. J. Dis. Child.*, 1921, xxii, 232.

Rose defines keratomalacia as xerophthalmia in which the most characteristic changes take place in the cornea, and states that the condition is quite rare, the four cases reported being the only ones in 28,000 admissions to the children's department of the Johns Hopkins Hospital. These cases are reported in detail with two necropsy reports. In one case of death no postmortem examination was made. One patient lived.

Rose reviews the reports of various men who did not at first understand the disease fully, considering it a complication of an acute infection of a neuroparalytic keratitis, a manifestation of congenital syphilis, or an entity with a specific bacteriological cause. More recently the relationship between malnutrition and the disease was established, Spicer being one of the first to observe that the condition occurred only among artificially fed infants kept on a diet deficient in nitrogenous elements.

Mori in 1904 noticed 116 cases of a very similar condition in which cod liver oil acted as a specific and concluded that the disease was due to a lack of fat in the diet. In Germany a very similar condition known as "Mehlnaehrschaden" was found in infants whose diets consisted almost exclusively of carbohydrates. Much work has been done in the past four or five years, especially by McCollum and Davis, experimenting on rats, which shows the close relationship between the lack of fat-soluble vitamine A in the diet and xerophthalmia. The author cites also the work of many other investigators. The pathology he has given in detail. He comes to the conclusion that the condition is a deficiency disease rather than an inflammatory process as was heretofore generally believed.

THOMAS D. ALLEN, M.D.

Chance, B.: Radium Plugs for the Dissolution of Orbital Gliomatous Masses After Excision of the Globe. *Am. J. Ophthalm.*, 1921, iv, 641.

A profoundly cachectic child under 3 years of age was brought to the author suffering much pain and with both eyes filled with yellowish masses. A diagnosis of bilateral glioma was made. Three months later the enormously distended right globe, which had ruptured, protruded between the lids, and, projecting through the anterior segment, was a granular, pultaceous mass which bled at the slightest touch. Excision was consented to by the parents. The globe was freely movable, the tumor mass not having perforated the sclera, and the orbit was quite free from nodules.

In the meantime the disease had progressed in the left eye but instead of rupturing anteriorly, the swelling suddenly subsided, the globe sinking into the orbit and rupturing posteriorly. Its growth, however, soon caused further distention of the globe and the eye was excised. The operation was difficult because of the mass which filled the apex of the orbit. The child immediately improved in general health.

In two months the left orbit began to fill and soon extended beyond the ridges, pushing the lids forward. Nine large radium needles in hollow, non-corrosive nickel steel cases 20 to 25 mm. long and

2 mm. thick, each containing 10 mg. of radium sulphate, were inserted into this mass and five smaller needles and one large needle into the presumably unaffected tissue in the right orbit. They were left in place for twenty hours.

This treatment was followed by shrinking of the tumors and apparent cure.

The difficulties attending the use of radium in metal containers was greatly overcome by the composition of the metal employed in these needles which, besides being non-corrosive, filtered out the harder and more deeply penetrating rays.

C. CORBIN YANCEY, M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Kelty, R. A.: The Tonsils as Foci of Infection.
J. Med. Research, 1921, xlii, 315.

Foci of infection may be divided into two groups, active and inactive. Inactive foci are those which, though containing living and virulent organisms, do not produce general disease, being well walled off, but remain as potential sites of infection. The active types, on the other hand, either by reason of the virulence or the numbers of their organisms are constantly pouring into the circulation not only the organisms themselves but also the products of their growth.

The study reported was undertaken to determine definitely whether tonsillar tissue does or does not contain actual organisms. The material consisted of both tonsils removed from a series of routine cases selected from a large clinic as those requiring tonsillectomy by reason of the fact that they showed disease clinically. The patients included both adults and children, the latter predominating, and the tonsils showed grossly and histologically the same changes as those noted in a series removed from soldiers.

Immediately after their removal the tonsils were sent to the laboratory in sterile gauze, the epithelial surfaces of both were thoroughly seared with a red-hot copper searing blade, and material from the inside was expressed onto the seared surface by pressure. This material included that present in the crypts as well as the cellular elements from the tonsillar substance. Its character varied from the soft pulpy cells of the tonsillar tissue to a purulent material from confined abscesses, including the inspissated cheesy material of constricted crypts. The author states that it is practically impossible to separate the material deep in the crypts from the tonsillar tissue, and it does not seem that this separation is necessary to obtain proof that the tonsils harbor micro-organisms.

It is true that the epithelial lining of the crypts may act as an impassable barrier to the invasion of micro-organisms from the inspissated contents of the crypts but their constant and close association in this position makes it almost a certainty that if they are present here they will be present in the tonsillar tissue. This, it seems, is a weak point in the evidence that tonsillar tissue is the actual seat of micro-organisms but the construction of the tonsils will not permit a clear-cut differentiation between the two situations.

The results of the experiments are summarized as follows:

1. The tonsils have been shown to be the avenues of invasion for various micro-organisms.

2. The tonsils are to be considered as foci of infection, active or inactive, from which the absorption of toxins into the general system takes place.

3. The tonsils are considered foci of infection, active in character, from which micro-organisms are poured into the general circulation, producing bodily disease.

4. That the tonsillar changes are those of inflammatory reactions against foreign stimuli is evidenced by their gross and histologic structure.

5. Nine hundred and eighty-five organisms representing sixteen different types and fifty-three combinations were found in 388 cases.

6. The organisms were those usually found in oral flora.

7. Streptococci predominate but are closely followed by staphylococci, these two organisms constituting 65 per cent of the total number.

GEORGE E. BEILBY, M.D.

Moore, L.: The Surgical Removal of the Tonsils.
Brit. M. J., 1921, ii, 437.

Moore discusses the local methods of arresting serious hæmorrhage from the tonsillar bed, such as pressure with gauze sponges, the application of hæmostats, the ligating of vessels, and the suturing of the faucial pillars.

The risk of subsequent hæmorrhage can be minimized by keeping in mind the causes and by attention to the following precautions:

1. In those cases in which surgical procedures are contra-indicated operation should not be performed or should be postponed.

2. The operation should be performed only in a hospital or nursing home.

3. Careful attention must be given to the preparation of the patient for the operation.

4. An expert anæsthetist is necessary.

5. The surgical procedure used should be one in which easy control of bleeding may be secured at the time of the operation.

6. There must be adequate postoperative supervision and care.

O. M. ROTT, M.D.

Dutheillet de Lamothe, G.: The Surgery of the Palatine Tonsil (Contribution à l'étude de la chirurgie de l'amygdale palatine). *J. de chir.*, 1921, xviii, 337.

The author compares the various methods of removing the palatine tonsil and states that most of them are incomplete as neither the fibrous capsule nor the infected crypts are removed entirely. His own method, a modification of Vacher's, consists in more complete liberation of the gland by dissection of the part adherent to the palatine arch and liberation of the superior pole not only in front but

also above and behind. Ethyl chloride is the anæsthetic employed. The liberation of the superior tonsillar pole is effected as follows:

The left tonsil having been pulled into the mouth with the forceps, a buttonhole incision is cut in its middle third with a curved scissors sharpened on the outer as well as on the inner edges. The scissors is inserted under the palatine arch and cuts the triangular fold, His' fold, etc. These thin membranes yield without resistance and there is little hæmorrhage. The tonsillar fossa being thus widely opened, the forceps holding the tonsil is basculated to draw the superior pole from the supratonsillar fossa in which it is almost always deeply embedded. At the same time the closed curved scissors is utilized as a dissector and to push the superior pole down; it is passed from the outside inward and sections the fibers which bind the tonsil to the walls of the fossa. When the superior pole is free the tonsil is removed by snaring its pedicle.

For the right tonsil the posterior blade of the scissors is introduced under the triangular fold and the latter is severed by one cut from above downward. Strong traction being made on the tonsil, the adhesions fixing the superior pole are sectioned by a series of small cuts. The superior pole is disengaged by applying the concavity of the scissors at its upper part.

W. A. BRENNAN.

O'Malley, J. F.: Conditions Predisposing to Hæmorrhage in Tonsil Operations. *Brit. M. J.*, 1921, ii, 433.

The contra-indications to operation and the prophylactic measures are summarized as follows:

CONTRA-INDICATIONS TO OPERATION

1. Tonsile: (a) acute inflammation and quinsy; (b) ulceration (erosion of vessels); (c) malignant disease.
2. Vessels in tonsil region: (a) pulsating and tortuous ascending pharyngeal, internal carotid, external carotid; (b) aneurism of same vessels; (c) angioma of fauces.
3. Blood states affecting coagulability of the blood: (a) hæmophilia; (b) purpura; (c) anæmias; (d) soon after infectious fevers (temporary).
4. Physiological changes related to blood loss: (a) menstruation; (b) menopause (temporary).
5. Other diseases (affecting tissues of vessel walls and vasomotor control): (a) renal disease; (b) cardiac disease; (c) alcoholism; (d) syphilis; (e) thyroid gland toxin; (f) suprarenal gland toxin; (g) pituitary gland toxin.

PROPHYLACTIC MEASURES

1. In children: Exclude hæmophilia. If present, treat. In adults: Exclude diseases mentioned above. If present, treat.
2. Increase coagulability of the blood: Calcium lactate; horse serum; human blood serum; hæmoplastin; coagulose; coagulin (Kocher-Fonio); pituitrin.

3. Increase constriction of vessels in arrest of hæmorrhage: (a) adrenalin; (b) pituitrin.

O. M. ROTT, M.D.

McKenzie, D.: The Treatment of Hæmorrhage in Tonsil Operations. *Brit. M. J.*, 1921, ii, 440.

McKenzie discusses the treatment of hæmorrhage during and after operations on the tonsil. When the bleeding is from the posterior aspect of the anterior pillar he nips the raw posterior surface of the pillar with the side of a long straight pair of pressure forceps, pressing in the pillar between its jaws from in front with the forefinger of the disengaged hand. The point of the forceps being free, a ligature can be easily thrown over it.

On the tonsil bed he frequently seizes the vessel with an old-fashioned pair of tongue forceps as it is easier to pass the ligature over the obtuse oval end of this instrument.

He does not favor suturing the faucial pillars or ligating the carotid.

If the bleeding points cannot be seen or secured, McKenzie favors the use of the Watson-Williams self-retaining clamp.

In concluding his article he urges that the tonsils be removed by a cervical dissection from within, and that the old rule of arresting all hæmorrhage at the time of the operation with forceps and ligatures if necessary should invariably be followed.

O. M. ROTT, M.D.

New, G. B.: An Unusual Case of Bilateral Abductor Laryngeal Paresis. *Laryngoscope*, 1921, xxxi, 630.

The author reports a case of bilateral abductor paralysis observed at the Mayo Clinic.

It has been demonstrated by Russell that the fibers supplying the abductor muscles of the larynx run in a distinct bundle on the inside of the recurrent laryngeal nerve and can be isolated and stimulated. Further, it is known that on prolonged stimulation of the recurrent laryngeal nerve, the abductor muscles are the first to cease their function, and that clinically, abductor paralysis due to involvement of this nerve or to central lesions is not uncommon.

In the case reported, use of the voice for a fraction of a minute so tired the abductors that the onset of paralysis could be observed. The patient was 64 years of age and for four years had suffered from chronic anterior poliomyelitis. He had atrophy and weakness of the lower extremities and to a less degree of the upper extremities, with beginning foot drop and fibrillary twitchings. The first laryngoscopic examination showed normally active cords. On repeated phonation the abductors on the right side gave out completely and the right cord assumed a position of definite abductor paralysis. On the left side the condition became about half as marked as on the right. After a rest of five to ten minutes

recovery was complete. Paralysis was produced several times in the manner described and was noted by other observers.

J. W. Ross, M.D.

MOUTH

Shearer, W. L.: *The Pathology of the Mouth and the Surgical Principles of Its Removal. J. Radiol.*, 1921, ii, 1.

Shearer reports that in a large number of cases of chronic alveolar abscesses and other disease conditions of the teeth the removal of the teeth does not remove the condition as the latter usually involves the bone surrounding the teeth. He therefore recommends the following procedure:

The muco-periosteum is reflected up to the root ends of the tooth sockets, the external alveolar plate of bone is taken off, and the diseased area then

removed. The bone is smoothed, leaving no jagged edges, and the lingual, buccal, and gingival mucosa is trimmed and then sutured with horsehair. The sutures are removed in from four to five days.

In many cases antrum diseases are due to drainage into the sinus from an alveolar abscess around the root ends of non-vital teeth. The author claims that the following principles should govern the treatment of chronic infection in the maxillary sinuses:

1. If the antrum disease is of dental origin, the dental pathology should be taken into consideration and removed.

2. Well-established drainage must be considered.

3. The type of the operation should be one whereby ocular observation of the entire antral cavity can be had in order that polypi may be removed.

M. N. FEDERSPIEL, M.D.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

Nose

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E. WATSON-WILLIAMS. *Brit. M. J.*, 1921, ii, 446.

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Mouth

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INTERNATIONAL ABSTRACT OF SURGERY

FEBRUARY, 1922

ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

McArthur, L. L.: *Is the Surgeon of Experience Ever Justified in Violating the Recognized Surgical Technique in Dealing with Malignant Neoplasms?* *Surg., Gynec. & Obst.*, 1921, xxxiii, 406.

McArthur raises the question as to whether in certain selected cases we are ever justified in departing from the generally accepted rules for the surgical treatment of malignant growths. On the basis of forty years' experience he has decided in the affirmative. Several carefully selected cases which were operated upon are cited to support this view. He believes that, regardless of the histopathology present, extremely radical procedures may sometimes be rejected if the neoplasm has a capsule or limiting membrane.

The basic theme in this article is not purely the question of procedure in given cases of malignancy but a plea that surgeons consider each case individually from the standpoint of the procedure best for that particular patient rather than as a case in which a routine surgical technique should be employed.

LOYAL E. DAVIS, M.D.

Samuel, S.: *A Method of Skin Grafting.* *Brit. M. J.*, 1921, ii, 632.

A method of dressing the grafted area is described whereby it can be given saline irrigation without displacing the graft. At operation silk threads are passed from one skin edge to the other and into underlying granulation tissue. The area is then covered with a perforated protective dressing, a layer of gauze moistened with saline, and a layer of dry gauze. The threads are passed through the perforations and tied over the ends of thin rubber tubing laid across the dressings. A layer of wool and a bandage are then applied.

The grafts may be "fed" by dripping saline on the under dressing, from which it is carried down by the threads. The discharge is led away into the

dressings. The method requires a little time, but keeps the grafts from sliding over convex or concave areas and others on which it is difficult to maintain a dressing.

J. W. ROSS, M.D.

ASEPTIC AND ANTISEPTIC SURGERY

Cabot, H.: *The Doctrine of the Prepared Soil: A Neglected Factor in Surgical Infections.* *Canadian M. Ass. J.*, 1921, xi, 610.

The average surgeon is so greatly concerned with bacteria as the cause of infection that he may overlook some of the other conditions which predispose to it. For the development of infection conditions must favor the growth of bacteria; their mere presence will not always be sufficient. The surgeon who centers his attention on sepsis and its various aspects is apt to attribute a postoperative inflammation to incomplete sterilization. While a certain small percentage of such infections are due to faulty asepsis, various other factors are of great importance. The surgeon is responsible not only for his liability to introduce bacteria, but for his failure to protect the patient from conditions which make infection possible. Such conditions may be either general or local. The former, which cause a decrease in resistance, are:

1. Fear. A patient who goes to operation with great dread and anxiety is much more apt to have a poor result than one with the opposite attitude.

2. Starvation. This is not so often a factor as formerly as today patients are allowed more nourishment. The diet should not be restricted, especially in the cases of patients at the extremes of life.

3. Dehydration. Water should be supplied in great quantities not only up to the time of operation, but even during the surgical treatment and afterward. If it cannot be taken by mouth it should be given by rectum and subcutaneously.

4. Anæstheisa. The anæsthetic should be carefully chosen and should be administered by an

expert. Ether is not always the logical anæsthetic simply because it is the most fool-proof.

5. Length of operation. The time consumed in the operation depletes the patient's vitality. Especially under prolonged ether or chloroform anæsthesia there is a very unfavorable action upon the tissues with lessening of the alkali reserve and at least some acidosis. The work should be done with as much speed as is consistent with thoroughness and correctness of technique. Naturally slow operators who cannot acquire speed should take up some other calling than surgery.

The local conditions favoring infection are:

1. The preparation of the skin. This should be simple. Irritating applications should be avoided.

2. Rough handling of the tissues. This is perhaps the most important local factor favoring infection. Roughness in handling, the use of dull instruments, grasping a mass of tissue to control bleeding, and heavy, careless dragging with retractors should be

avoided as they cause tissue necrosis which produces a good culture medium.

3. Faulty hæmostasis. Dry wounds heal quickest and with least infection.

4. Mass ligatures which destroy the tissue surrounding a vessel.

As illustrating conditions which produce infection, bladder cases are cited. In a normal undistended bladder catheterization after cystoscopy will not produce infection, even though the urethra is slightly injured. In an old distended bladder, however, quick catheterization causes damage to the mucosa by the sudden change of tension, so that petechiæ may be produced by the lack of resistance to the arterial flow and infection will supervene. The ordinary postoperative cystitis can be avoided if the bladder is emptied early and if a urinary antiseptic is administered when trauma to the bladder region and loss of the urinary reflex are apt to result.

MARCUS H. HOBART, M.D.

SURGERY OF THE HEAD AND NECK

HEAD

Lange, C.: The Examination of the Cerebrospinal Fluid in the Diagnosis of Brain Tumor (Was leistet die reine Liquordiagnostik bei der Diagnose des Hirntumors?). *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1921, xxxiii, 583.

After pointing out the reasons for the inadequacy of Nonne's method of examining the cerebrospinal fluid in the diagnosis of brain tumor—the method hitherto in general use—the author proposes a new procedure by which the laboratory diagnosis of such lesions is facilitated. In Lange's examination the findings include the color, the total albumin, the cell increase, the dissolved blood pigments, and a negative Lange's gold salts reaction.

The yellow tinge of the fluid is discussed in particular. This is not detected by mere inspection; a colorimeter is necessary. It has been demonstrated that it is not due to biliary pigment or the admixture of blood plasma. It may be caused by normal or broken-down blood pigments no longer demonstrable as such by spectroscopic or chemical means. No erythrocytes are then found in the sediment; the quantity of albumin is increased beyond the normal and albumoses are demonstrable by the gold salts reaction. The coloring matter, which is a light yellow, is no longer identifiable as blood pigment. If the clinician can then exclude an older, accidental or essential hæmorrhage, as is usually the case, the finding described can be very safely interpreted as indicating brain tumor.

Great quantities of dissolved, unchanged blood pigment and undissolved erythrocytes in the sediment are evidence that the essential hæmorrhage was not caused by tumor. The quantitative determination of albumin is important, but its mere qualitative determination is worthless.

Cytodiagnosis is almost always unsatisfactory. The Wassermann reaction is misleading. Lange's gold reaction and the determination of the yellow color constitute the most decisive diagnostic methods in cases of tumor.

The recognition of the regularity and significance of these findings has convinced the author that today, given certain clinical data, the diagnosis of brain tumor can be made with certainty from the cerebrospinal fluid.

HEINEMANN-GRUEDER (Z).

Porter, M. F.: The Surgical Aspect of Tumor of the Brain. *Ann. Surg.*, 1921, lxxiv, 321.

The author presents a very interesting discussion of the present status of our knowledge regarding brain tumors and reaches the following conclusions:

1. The term "brain tumor" should include all growths of whatever origin or nature, either in or on the brain.

2. Brain tumor is essentially a surgical malady.

3. Surgical intervention should follow promptly the diagnosis of a brain tumor. Postponement of operation for the purpose of locating the tumor in the hope of giving relief through antiluetic treatment, or to determine the character of the growth is seldom warranted.

4. Exploration of the brain with a solid needle is a valuable aid in locating a tumor and if properly done is free from danger.

5. X-ray or radium therapy should be used in all cases in which surgical removal is impossible and after the removal of malignant tumors.

FREDERICK CHRISTOPHER, M.D.

Frazier, C. H.: The Accomplishments of Intracranial Surgery. *N. York M. J.*, 1921, xxi, 369.

Since the onset of the war the number of neurological surgeons has increased sufficiently to justify

the establishment of a society of neurological surgeons. Perhaps this may be attributed to the greater experience, opportunities, and interests in this field offered young surgeons during the world war.

Frazier considers local anæsthesia in cranial surgery as inhumane and inconsiderate.

To repair the cranial defects resulting from the débridement technique used in treating war injuries he uses a graft composed of pericranium and a shell of the outer table of the skull.

Seventy-five per cent of brain abscesses are otitic in origin. The high mortality of this condition is due largely to difficulty in determining the location of the abscess and to secondary meningitis. As an aid in localization Frazier recommends more intensive study of the signs of disturbance of brain function, a better anatomical knowledge, and a study of a large series of accurately described cases. Brain abscess may have a long latent period. Meningitis may be prevented by Le Maitre's method. By this procedure the abscess is located with an exploring needle, and the smallest caliber drainage tube is introduced and left in place from twenty-four to forty-eight hours to permit the formation of adhesions to wall off the subarachnoid space. The tube is then replaced daily by a larger one until adequate drainage results.

In cases of pituitary lesions operation is delayed too long. Forty-five per cent of the author's patients were totally blind in one eye when he first examined them. There had been a warning four, five, and even ten years earlier. Disturbance of vision and headache are indications for surgical interference. Frazier uses the transphenoidal approach four times as often as the transfrontal route. Factors favoring the transphenoidal approach are its comparative simplicity, low mortality, and the usually immediate beneficial effect as regards vision. Direct illumination with a small incandescent lamp on a carrier at the extremity of the bivalve speculum greatly facilitates the use of this approach. In favor of the transfrontal route is the fact that before the operation it is impossible to determine with any certainty how far the lesion has extended beyond the sella contents or to distinguish a primary intrasellar lesion from one secondary to a primary suprasellar growth.

The author reports very encouraging results from the use of radium and the X-rays in twenty-four cases of pituitary lesions. He employs the transphenoidal approach as the first step in the surgical treatment and uses radium and the X-ray routinely in the after-treatment. If visual disturbances recur or sight is threatened, he resorts to the transfrontal approach and exploration.

Major trigeminal neuralgia seems to be on the increase, especially in persons under 40 years of age. The operative technique is almost perfect. One may do subtotal resection, conserve only the motor root, or leave the sensory root and remove only the motor root. Since Spiller proposed avulsion of the sensory root in 1910, the mortality has dropped from 5 to 1 per cent. The author reports one operative death

during the past eight years. Interest at present centers largely in the cases in which the sympathetic connection with the sphenopalatine ganglion is the important factor. Frazier is elaborating a technique which will make this ganglion as accessible as the gasserian ganglion.

The relation of the sympathetic system to painful lesions of the extremities, the so-called causalgias of war injuries, should lead to the study of the sympathetic system in painful conditions of the face.

Brain tumor cases are the most numerous and serious in neurological surgery. The following classification of brain tumors is suggested:

1. Pretentorial: (1) endothelioma, (2) glioma, (3) miscellaneous, including benign tumors.
2. Subtentorial: (1) potile angle tumors, not including acoustic tumors, (2) acoustic tumors, (3) tumors of the cerebellar hemisphere, including glioma and tuberculoma, (4) tumors in the neighborhood of the vermis.
3. Pituitary lesions.

Subcortical infiltrating glioma is usually inoperable. Endothelioma offers an opportunity for successful surgical removal. Sixty per cent of the author's cases were cases of sarcoma-endothelioma, and 38 per cent, cases of glioma. Lower operative mortality and more satisfactory results may be obtained when cases are referred early. A subtemporal decompression relieves subjective discomforts, conserves vision in early doubtful cases, and permanently relieves the pseudo-tumor cases.

Ventriculography, proposed by Dandy, is an important recent contribution to the methods of investigation and localization of brain lesions.

A ventricular puncture is much safer than a lumbar puncture for the withdrawal of cerebrospinal fluid to relieve extreme intracranial pressure.

Blood transfusion is of value in hastening convalescence. In suitable cases the author employs autotransfusion, using from 500 to 600 c. cm. of the patient's blood withdrawn the day before operation, citrated, and refrigerated.

The three safeguards to cranial exploration are skilfully induced anæsthesia, control of hæmorrhage, and control of the problems of intracranial pressure.

WALTER C. BURKET, M.D.

Jefferson, G.: Bilateral Rigidity in Middle Meningeal Hæmorrhage. *Brit. M. J.*, 1921, ii, 683.

The author reports two cases of middle meningeal hæmorrhage with bilateral rigidity of the trunk and limbs. Both lesions followed trauma and at operation fractures were found in the left temporal region and extradural clots were removed. Both patients were unconscious. Cheyne-Stokes breathing was present and the muscular rigidity was most marked at its crisis. As autopsy disclosed a unilateral lesion in both cases it was evident that the rigidity was due to changes in the intracranial circulation produced by the extravasations or the injury.

In Jefferson's opinion this syndrome is due to a relative deficiency or oversupply of blood to certain

regions of the brain and the release of lower neurogenic levels. This may be attributed to the increased intracranial pressure. The relationship between the crises of rigidity and those of the Cheyne-Stokes breathing supports the circulatory theory. These cases demonstrate that the condition is a physiological rather than an anatomical phenomenon.

MERLE R. HOON, M.D.

Payr, E.: The Etiology and Treatment of Trigeminal Neuralgia (Ueber Ursachendiagnose und Behandlungsplan der Trigeminusneuralgie). *Munchen. med. Wchnschr.*, 1921, lxxviii, 1030.

There are not only acute and chronic forms of trigeminal neuralgia, but also those of symptomatic, idiopathic, peripheral, and central origin. Acute neuralgia is known as an associated phenomenon in infectious diseases (influenza, malaria, typhoid). In the symptomatic forms with a recognizable anatomical cause there is an acute and a chronic stage, the latter the more important. These are the forms found in cases of disease of the teeth, jaw, nose, nasal accessory cavities, or the bones of the skull, compression due to calluses after fracture of the base of the skull, diseases of the ear and their complications, diseases of the eye, and injuries and diseases of the brain and its meninges.

In the idiopathic form diseases of metabolism are to be looked for, such as diabetes, gout, arteriosclerosis, chronic constipation and local diseases of the rectum favoring it, and poisonings due to substances such as lead, alcohol, nicotine, and mercury.

The affected organic systems should be rapidly examined one after another, without waiting to try out new experiments in treatment. Roentgenological examinations and Wassermann tests should not be forgotten. The acute forms must not be allowed to become chronic.

It is a good plan to make an anatomical diagram of the extent of the neuralgia and a record of the remedies already tried and their results. It is of great importance that the remedies used should be put down in their correct order for under certain circumstances one treatment will prevent the action of another.

The treatment of the acute form should consist in measures to cause sweating, antineuralgic medicine, and thorough evacuation of the intestines. Physical treatment is beneficial even in the subacute forms, but in the chronic is usually without effect.

The treatment of the symptomatic form belongs to the specialist. For the idiopathic form the following plan of treatment is recommended:

1. Internal medical treatment. Aconitin and ethylene trichloride seem to have a specific action.
2. Treatment by aperients. Even though the bowels move regularly, the advantage of purgation should be explained to the patient.
3. Antiluetic treatment, even when the Wassermann test is negative.
4. Psychotherapy.

5. Electrical treatment (galvanic current). This should be stopped if there are no good results after two or three weeks.

6. Simple anæsthetization of the nerve trunks with $\frac{1}{2}$ per cent novocaine solution, repeated several times if necessary. This is particularly good along the course of the first branch. A prolonged effect has been observed with the addition of $\frac{1}{4}$ per cent carbolic acid.

7. Roentgen-ray treatment. This should be given only in cases which have not been treated by injections of alcohol or peripheral operations.

8. Alcohol injections, peripheral for the first branch, at the base of the second and third branches, and into the ganglion. Injections into the ganglion are difficult and do not always have a permanent effect.

9. Operative treatment: (a) Extraction of the peripheral branches—recommended only for the supra-orbital and frontal nerves of the first branch as in the infra-orbital and mental nerves the recurrences range from 60 to 70 per cent (the collaterals of the individual branches have not yet been worked up). (b) Neurectomy in the course of the affected branch. (c) The same operation at the point of exit of the second and third branches at the base of the skull; the still unseparated main trunk should be separated at the foramen ovale or rotundum with a fine thermocautery at white heat. (d) Extirpation of the gasserian ganglion (mortality 5 to 16 per cent). (e) Severing of the trigeminus trunk at the apex of the petrous portion of the temporal bone.

BERNARD (Z).

Frazier, G. H.: The Surgery of the Trigeminal Tract. *J. Am. M. Ass.*, 1921, lxxvii, 1387.

Frazier calls attention to the fact that twenty years have elapsed since Spiller first proposed section of the sensory root in the treatment of trigeminal neuralgia. This procedure has more than fulfilled the claims of its sponsor as it is safer than gasserectomy and gives permanent relief. In the two decades that have passed since it was first performed the technique has been modified in its minor details from time to time until today it might be said that the operation has been perfected. Frazier's technique is as follows:

In the approach to the ganglion consideration is taken of the cosmetic result and the convenience of the access. The incision is concealed within the hairline and must be anatomically correct. A cutaneous flap is reflected forward, and a musculo-aponeurotic flap reflected backward. Through the temporal fossa is opened an avenue wide enough to give an ample and unobstructed view of all the structures to be dealt with. Hæmorrhage from the middle meningeal artery is controlled by plugging the foramen spinosum with cotton.

The sensory root is exposed not only at its entrance to the ganglion but from that point back to where it enters the middle fossa, that is, throughout its entire course in the middle fossa. To secure this exposure the dura is separated from the anterior

surface of the petrous bone. The sensory root thus exposed is torn free from its attachment to the pons, merely cut across, or severed in its entirety. The motor root is sacrificed with the sensory root or is conserved. It is exposed by lifting the sensory root upward. If possible it should be left as it prevents atrophy of the temporal, masseter, and pterygoid muscles.

In conclusion the author states that the major operation for trigeminal neuralgia will give satisfactory results only when proper discrimination is exercised in the selection of cases, and that it should be reserved for cases of major trigeminal neuralgia or Fothergill's disease. H. A. McKnight, M.D.

Cross, G. H.: Plastic Repair of the Eyelids by Pedunculated Skin Grafts. *J. Am. M. Ass.*, 1921, lxxvii, 1233.

The eyelid may be restored by means of: (1) pedunculated autogenous grafts; (2) free dermic or Wolff grafts; (3) epidermal or Thiersch grafts. The latter are the best for cases of severe burns with a glazed, parchment skin surface, cases of ectropion due to contracture of scar tissue, and those in which the use of a pedunculated graft, though indicated, is impossible.

The pedunculated graft is very successful in facial work. With the base of the flap at the external canthus, lid tissue may be obtained from the temple, eyebrow, scalp, or cheek; with its base over the nose the tissue may be obtained from the forehead; and with the base on the neck, skin from the chest may be used, the pedicle of the graft being tubed according to the Gillies method.

Between the primary repair and the plastic operation it is essential that sufficient time be allowed to elapse so that shrinkage and contracting of scars shall have ceased and the injured parts shall have become restored to normal.

Removal of the lachrymal sac should be the first step in all cases in which the lachrymal area is involved as this lessens the danger of the loss of the graft by infection. It is necessary also to visualize the change in the shape and position of the area from which the graft was removed. Each case is a law to itself and must be dealt with accordingly.

The author presents four cases with drawings and photographs which forcibly demonstrate the value of the pedunculated graft. The technique, which was practically the same in all of these cases, was as follows:

Following the extirpation of the sac the edges of the lower lid and conjunctiva were freed from the scar and the edges dressed up to determine the size and shape of the graft required. Then, from a piece of rubber tissue, a model of the graft was cut, a good margin being allowed for shrinkage. With this form, the best site for the graft was determined. In Case 1 the temple was selected. The graft was marked out with the point of a knife, dissected, and swung into place where it was sutured with interrupted silk sutures or with mattress sutures, a

continuous overcast suture being used to approximate the edges. The denuded area from which the graft had been taken was covered by undermining the surrounding skin well back, drawing the edges together, and suturing with silk, horsehair, and silk-worm-gut. In some cases it is best to cover in the denuded area first and suture the graft afterward. The base of the graft must turn on its own anchorage; therefore it is important to plan its position very carefully, keeping it as close to its new bed as possible and avoiding too great an angle so that there will be no puckering of the skin. In order to prevent sloughing the tip of the graft should be made blunt and rounded.

J. C. BRASWELL, JR., M.D.

Berne, L. P.: Rhinoplasty: The Artist-Surgeon's Opportunity. *Internat. J. Surg.*, 1921, xxxiv, 343.

However great his technical skill, the rhinoplastic surgeon can never attain the highest rank in his profession unless, in addition to his ability as a surgeon, he possesses a sense of beauty and proportion and an appreciation of the harmony necessary between the various parts of any given object to fuse it into a complete and satisfactory whole.

The author classifies his operations into two groups: (1) cosmetic, and (2) reconstructive. By those of the first group he endeavors to correct noses which are large, hooked, long, laterally deflected, snub, bulbous, wide-nostriled, or depressed. By those of the second he attempts to reconstruct the nose which has been mutilated by a crushing injury, amputation, a burn, or disease, or to supply a congenital defect.

The technique of rhinoplasty is described in detail, including the preparation. Berne emphasizes his pyriform incision which he regards as the ideal initial incision for almost every variety of cosmetic correction. This incision, about $\frac{1}{4}$ in. long, is made in the mucous membrane at the right and left upper and inner part of the pyriform aperture, the knife passing underneath the skin in an upward direction.

The methods used in a variety of operations are described and very satisfactory results are shown by photographs. Berne's conclusions are as follows:

1. To ensure success, the surgeon must possess a thorough understanding of the plastic art.

2. Each case must be carefully studied before operation and a definite plan of procedure laid out.

3. The greatest ally of plastic surgery is time. A rhinoplastic surgeon's ability should not be measured by the consumption of time as success is dependent upon patience and confidence in his ability to accomplish what he planned.

4. A series of operations is often necessary for the ultimate success of nasal correction.

5. Most scrupulous asepsis and careful postoperative care are essential in every case.

6. The successful final results obtained in the cases reported justify the more general adoption of the operative procedures described.

FREDERICK CHRISTOPHER, M.D.

NECK

Crile, G. W.: Surgery Versus the Roentgen Ray in the Treatment of Hyperthyroidism. *J. Am. M. Ass.*, 1921, lxxvii, 1324.

After reviewing the literature bearing upon the comparative effects of surgery and the X-ray, the author summarizes the experience of his associates and himself in the Lakeside Hospital.

On the basis of a series of comparative studies, Christie rates bilateral partial thyroidectomy first, the roentgen rays second, and ligation third in order of efficiency in reducing the metabolic rate. Crile confines his discussion to a comparison of thyroidectomy and roentgen-ray treatment as to: (1) the resultant discomfort; (2) the resultant period of disability; (3) the immediate mortality; and (4) the end-results.

The prime findings in favor of thyroidectomy with regard to these points are:

1. Less mental disturbance.
2. An average stay in the hospital of $25\frac{1}{4}$ days in 500 cases broken by the interval between the ligation and the thyroidectomy, which is obviously less than the loss of time and inconvenience of the repeated visits to the hospital for roentgen-ray treatment.
3. The practically negligible mortality. In the last 500 consecutive thyroidectomies at the Lakeside Hospital the mortality was 1 per cent, and in the last 500 ligations it was 0.4 per cent. As obviously the immediate mortality of roentgen-ray treatment is not to be considered, there is no basis for comparison in this respect.
4. At least three years must elapse before the results of the operations by present methods can be considered as stabilized.

As hitherto the only objection to surgical treatment has been the mortality, the author concludes that, this having been practically eliminated and the possibility of surgical treatment having been extended to meet every case, surgical reduction of the thyroid activity becomes the most curative method of treatment.

R. G. DOUGHTY, M.D.

Sistrunk, W. E.: The Indications for Surgical Treatment in the Different Types of Goiter. *Surg., Gynec. & Obst.*, 1921, xxxiii, 348.

Plummer has classified goiters as colloid, adenomatous, and exophthalmic. All other types are variations or combinations of these.

Colloid goiter occurs in youth, most commonly between the ages of 15 and 25, and probably never occurs after the thirty-fifth year of age. This type of goiter may be accompanied by nervous symptoms and tachycardia, but may be distinguished from exophthalmic goiter by the metabolic rate which is normal or slightly decreased, never increased. However, as the Goetsch test may give a marked reaction, these cases are frequently diagnosed as exophthalmic goiter and erroneously operated upon.

Clinically, the thyroid is uniformly enlarged and has a characteristic soft, granular feel. Usually it produces no symptoms, except slight nervousness and worry over its presence. Microscopic examination shows the acini to be dilated and filled with colloid, while the epithelium of the acini is low and flat in appearance. Colloid goiter is the only type that disappears under the administration of iodine and thyroxin and is not a surgical condition. Colloid goiters may recur when removed surgically unless iodine or thyroxin is administered post-operatively.

Adenomatous goiter is the most common type and usually first appears between the ages of 15 and 20. It is caused by the development of encapsulated adenomata within the substance of the thyroid gland, which are probably developed from foetal rests. In the early stages there are no symptoms except when the adenomata develop in such a position as to cause pressure on the trachea. Degenerative changes due to hæmorrhage are prone to occur and result in the clinical varieties of goiter, such as the hæmorrhagic, cystic, calcareous, etc. Sometimes there is a decrease in the secretory activity of the gland producing a condition of mild hypothyroidism with a lowered basal metabolic rate.

Twenty-three per cent of the patients with adenomata of the thyroid examined at the Mayo Clinic were found to be suffering from hyperthyroidism. The symptoms of this condition do not develop until the goiter has been present for an average of sixteen years. The picture of hyperthyroidism associated with adenoma is clinically different from that of exophthalmic goiter although these two conditions are often confused.

Adenomatous goiters seldom produce symptoms in persons under 30 years of age. In toxic cases the metabolic rate is increased, although usually not so much as in exophthalmic goiter. The cardiovascular system is more severely affected in hyperthyroidism associated with adenomata, while in exophthalmic goiter the central nervous system is more profoundly affected. Myocardial degeneration may occur before the toxicity is recognized and the patient suffers from palpitation, arrhythmia, dyspnoea, and oedema. If the myocardial degeneration is not marked, the blood pressure is usually increased. Other symptoms of hyperthyroidism, such as tremor, a flushed, moist skin, tachycardia, and loss of weight and strength are also present.

Clinically, the gland is irregular, asymmetrical, and single, or many rounded tumors may be felt, the consistency of which varies with the degenerative changes. Microscopically, areas of encapsulated adenomatous tissue are found which may be foetal in type or resemble the adult acini and contain large amounts of colloid.

Operation is the best treatment for adenomatous goiter, but in advising it certain factors are to be considered. Persons under 25 or 30 should not be

operated on, as both lobes are involved and small adenomata may be overlooked which subsequently would grow. After this age, if any of the adenomata are 3 or 4 cm. in diameter a partial thyroidectomy should be done. If symptoms of toxicity are present when the goiter is first seen the condition is definitely surgical provided the damage done is not so great as to make operation too hazardous. Pre-operative rest and digitalis for serious myocardial change reduce the operative risk.

Exophthalmic goiter may occur at any age, but is most common in the third and fourth decades. Frequently the onset is sudden, with a rapid increase in symptoms, but it may also be insidious. Such symptoms as nervousness, tachycardia, hæmorrhage, flushed, moist skin, and loss of weight and strength may occur before enlargement of the gland is noticed. Following a thyroid crisis the symptoms and general condition show improvement, but in a majority of cases recurrence takes place within a few years. During a crisis damage to the heart and vital organs may be so marked as to cause chronic invalidism or death.

On palpation the gland is found to be symmetrically enlarged and quite hard. Microscopic examination shows acini containing very little colloid and lined by columnar epithelium.

Surgery gives the best results in exophthalmic goiter. In severely toxic patients one or two ligations are necessary before thyroidectomy is performed. Ligation is done as a means of testing the patient's endurance or to prepare for thyroidectomy. The reaction following this procedure is similar to, but less marked than, that following thyroidectomy. It consists of an increase in the pulse and temperature, vomiting, nervousness, and mental irritability. Usually it begins shortly after the operation and continues for thirty-six to forty-eight hours and then gradually subsides. The determination of the basal metabolic rate is a great aid in the diagnosis of the early stages of exophthalmic goiter, but does not indicate the damage to the vital organs which has already taken place and for this reason cannot be used as a means of determining the type of operation. The results of surgical measures depend on the extent of this damage at the time of operation.

MERLE R. HOON, M.D.

Lorin, H.: *The Anatomy and Surgery of the Parathyroids* (Anatomie et chirurgie des parathyroides). *J. de chir.*, 1921, xviii, 449.

The author confined his studies to the external parathyroid glands. The internal parathyroid glandules are an integral part of the thyroid gland and have their origin in the branchial clefts. In animals these glandules are present as distinct bodies, but in man this is not true. The superior parathyroids in man probably represent the internal parathyroids of the lower animals. Anatomical dissections were made to demonstrate the exact relationship of the parathyroids, and X-ray studies were made of the material to show the exact

course and extent of the arteries supplying the glandules.

If the inferior thyroid artery is followed to its terminal ramifications, the parathyroids are found lying in the middle of a small tag of fatty tissue on the posterior surface of the lateral lobe of the thyroid gland. On each side are one or two glands attached to a small pedicle. The parathyroids lie in a zone considered dangerous from a surgical standpoint because of the proximity of the recurrent laryngeal nerve and the inferior thyroid artery.

This zone, or more accurately, the thyroid space, is bounded on one side by the thyroid gland and on the other by the aponeurosis. The finger may be swept around it to a point where the thyroid is in contact with the trachea and larynx. This space, which is closed above and below, contains the sternothyroid muscle. Here lie the parathyroid glands outside the capsule proper of the thyroid gland and outside the superficial vessels ramifying upon the capsule. Only once were the parathyroids found upon the anterior surface of the thyroid gland. When two glandules are present upon each side they lie in a vertical line. They vary in size from that of a grain of coffee to that of a cherry. They are somewhat flattened and oval, and at times have a pointed extremity. Their surface is usually smooth but occasionally may be lobulated. Their color is that of the normal thyroid gland. They are distinctly encapsulated and have numerous small vessels coursing upon their surface beneath the capsule. Because of their constant presence and size, the inferior parathyroid glandules must be called the principal organs and the superior glandules designated as accessories. Four glandules were found in five of fifteen specimens; two, in seven; and three in three specimens.

Each parathyroid is supplied by a special artery. The vessel appears very large as compared with the glands. The inferior parathyroid artery is generally a terminal branch of the inferior thyroid as the latter ramifies upon the surface of the gland. The superior parathyroid vessel is very small and difficult to study. In rare cases it represents a terminal branch of the superior thyroid artery. More commonly, however, it is a branch of the inferior thyroid. Thus the entire blood supply of the superior and inferior parathyroids is dependent upon the inferior thyroid artery, but the circulation of the thyroid and parathyroid glands is entirely distinct and independent. There are no vessels extending from the thyroid gland to the parathyroids.

During thyroidectomy it is necessary to preserve the parathyroids in order to prevent parathyroid tetany. In performing thyroidectomy the author believes it is absolutely essential to save the posterior wall of the capsule as well as a portion of the gland at both the superior and inferior poles. In difficult enucleations and resections prophylactic ligation of the inferior thyroid artery facilitates surgical intervention. In simple enucleation it is useless.

Ligation of the inferior thyroid vessel within the true capsule of the thyroid gland or within the thyroid space endangers the parathyroids. Lorin advises traversing the sternomastoid and sternohyoid spaces in ligating the inferior thyroid. The

perithyroid fascia should not be disturbed. In order to insure complete vascularization of the parathyroids in performing multiple ligations it is necessary to conserve one thyroid artery and one of the four poles.
LOYAL E. DAVIS, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Taylor, W. H., and Taylor, N. B.: Tidal Irrigation of Wounds by Means of Liquid-Tight Closure, with Special Reference to the Treatment of Empyema of the Thorax. *J. Am. M. Ass.*, 1921, lxxvii, 1393.

Tidal irrigation is produced by the alternation of positive and negative pressure in the wound. The apparatus consists of a rubber cap resembling in some respects a tam-o'shanter. Two tubes issue from its cover, one being connected with a reservoir of fluid above, and the other leading to a waste pail. Each of these tubes is provided with a clip. The cap is bandaged in position so that its interior and the interior of the wound form one cavity which is liquid-tight. To obtain positive pressure in the wound the clip on the tube leading from the reservoir is opened and the clip on the tube leading to the waste pail is closed. Negative pressure is obtained by reversing these manipulations.

The authors report one of a series of eight cases of chronic empyema treated by this method. A 5 per cent sodium chloride solution was used. Spontaneous closure resulted in all cases in from four to six weeks. In a case reported in this article spontaneous closure occurred in spite of the fact that a large pneumothorax persisted on the affected side. This cavity remained sterile and when the patient was seen about half a year later had not become appreciably reduced. The authors claim that the method described constitutes an improvement over other negative pressure methods in that it is simple and clean, it liquifies the contents of the cavity completely, it reaches all points of the cavity, and it can be employed following either rib resection or intercostal puncture. RALPH B. BETTMAN, M.D.

Percy, J. F.: A New and Advanced Surgical Treatment for Breast Cancer. *Surg., Gynec. & Obst.*, 1921, xxxiii, 417.

To improve the results of operations for cancer of the breast Percy makes the following suggestions:

1. That only the hot knife be used in the removal of breast carcinoma, including a complete dissection of the axilla. The unheated knife does not devitalize any of the malignancy it does not remove. The hot knife does. The cold knife does not spoil the soil for the further development of cancer. The hot knife does. The knife unfortified by heat vaccinates into new areas the cancer it touches. The hot knife does not. The cold knife stimulates the growth of the unremoved cancer cells. With the hot knife this is impossible.

2. That in the advanced type of case no attempt be made to preserve or secure skin flaps.

3. That the skin around the denuded area (left without flaps when the breast and axillary glands are removed) be undermined from 2 to 4 in. with the hot knife.

4. That in the after-treatment, besides the use of Dakin's solution, the arm on the side operated upon be maintained in an elevated position with the forearm resting on the top of the head until practically the entire surface denuded by the hot knife is covered with new skin.

5. That vigorous daily massage and forcible movement of the skin and arm adjacent to the denuded area be instituted as soon as granulations have begun to appear.

6. That only cases in which an inaccessible metastasis has developed should be regarded as inoperable by the heat technique.

J. D. ELLIS, M.D.

Halsted, W. S.: The Swelling of the Arm After Operations for Cancer of the Breast—Elephantiasis Chirurgica—Its Cause and Prevention. *Bull. Johns Hopkins Hosp.*, 1921, xxxii, 309.

Edema following operative blocking of the lymphatics is seen most frequently after the radical operation for cancer of the breast. The suggestion has been made that the hard swellings developing late after operations are due to lymphatic blocking, while the soft edema which comes on more promptly is due to venous obstruction. Such obstruction is undoubtedly a cause, but the author believes that infection plays a large part in determining the amount of swelling and the time of its appearance. As substantiating this theory he cites the case of a woman who had no postoperative swelling in the arm following a radical operation for cancer of the breast until during an attack of influenza. At a second operation performed soon afterward for the removal of recurrent glands the axillary vein was found to be completely occluded by nodules which undoubtedly had been present before the time of infection and before the swelling. In another case postoperative intermittent swelling of the arm appeared only when the arm was infected.

Halsted has devised an operation for the removal of breast cancer whereby the lymphatics are not greatly disturbed. In this procedure no incision is made down the arm; the skin at the upper margin of the wound is tacked with fine silk sutures to the first intercostal muscle and fascia so as to raise the axillary fornix as high as desirable and eliminate all



The redundant axillary skin is drawn up by the fingers. The skin has been stitched to the underlying muscles at the margin of the area to be grafted, the apex of which corresponds to the lower border of the first rib.

tension on the skin or scar. No attempt is made to pull the skin margins together. Instead, the skin is fastened up close to the subclavian vessels and sometimes even around them so as to leave no dead spaces underneath. The uncovered area is then filled with skin grafts.

During the past eleven years of its use the results of this operation have been good. There has been no immediate swelling of any importance and necrosis has usually been absent. The later oedema also has been largely obviated.

In experiments on dogs oedema has not been produced by interruption of venous and lymphatic channels.

The most common cause of postoperative swelling as shown in the authors' clinic is recurrence of the malignancy, but he reiterates his belief that infection is very frequently the underlying cause of oedema. Such swelling might be called "surgical elephantiasis (elephantiasis chirurgica)."

Streptococcal infection is favored by lymphatic obstruction. Matas has shown the importance of such infection in the production of elephantiasis and elephantoid conditions. The histopathologic elements essential for the picture of elephantiasis are:

1. A mechanical obstruction or blockade of the veins and lymphatics of the region, usually an obliterative thrombophlebitis, lymphangitis, or adenitis.
2. Hyperplasia of the collagenous connective tissue of the hypoderm.
3. Gradual disappearance of the elastic fibers of the skin.

4. The presence of a coagulable dropsy or hard lymphoedema.

5. A chronic reticular lymphangitis caused by secondary and repeated invasion of pathogenic micro-organisms of the streptococcal type.

The author summarizes his conclusions as follows:

1. Oedema following operations for cancer of the breast is caused by infection superimposed upon obstruction of the lymphatic and venous channels.

2. The tension and blockade of these channels can be largely obviated if the skin is not stretched to perform the plastic operation.

3. Substitution of skin grafting and the tacking of the skin to the underlying tissues will allow free movement of the arm and prevent obstruction.

MARCUS H. HOBART, M.D.

TRACHEA AND LUNGS

Priesel, A.: Primary Carcinoma of an Intratracheal Struma (Primäres Carcinom einer intratrachealen Struma). *Monatsschr. f. Ohrenh.*, 1921, lv, 593.

Primary carcinoma of an intratracheal struma is a very rare condition. The author reports such a case in a man 56 years of age who had suffered for a long time from bronchitis accompanied by the expectoration of blood, pressure on the right side of the throat, and emaciation.

At the time of the patient's admission to the hospital he had marked cyanosis of the face, strident inspiration, a diffuse bronchitis, a temperature of 39 degrees C., and purulent, bloody sputum. The clinical diagnosis was bronchopneumonia from aspiration following perforation into the trachea of a high oesophageal carcinoma. Laryngoscopic examination revealed reddening of the vocal chords. Death occurred in eight days.

Autopsy disclosed on the right side of the trachea a whitish, hard swelling $\frac{1}{2}$ cm. high and 3 cm. long which began below the cricoid cartilage, included the four upper tracheal rings, and pressed the oesophagus to the left and backward. The thyroid gland was enlarged and easily separated from the swelling in the trachea. The parathyroid glands were in their usual position.

A cross-section through the trachea and oesophagus revealed a lobulated tumor the size of a cherry which pressed into the trachea, forming a crescent-shaped cleft and leaving a free passage only 2 mm. wide. The portions of the tumor facing the left and anterior surfaces of the tracheal lumen showed signs of extensive hæmorrhage.

Histologic examination showed the growth to be a carcinoma of an aberrant thyroid. In certain areas there was old thyroid tissue with thick colloid which took a deep stain and an increased hyalin infiltration. In other areas portions of the tumor were seen to be constructed of newer tissue which presented both colloid-forming thyroid tissue and epithelial formations. Some of the epithelial formations proliferated into the mucosa from the nodules.

which were probably of purely submucous origin, and others had begun to grow into the older, regressively altered tumor parts and had penetrated a small cyst in the wall of the trachea which was lined with ciliated epithelium.

Regarding the origin of the growth the author states that he is of the opinion that it was a defect in the embryonic primordial cells, a fetal inclusion of the thyroid gland. In this he agrees with the theory of Bruns and not with that of Paltauf who attributes such neoplasms to proliferation of thyroid tissue into the wall of the trachea. Bruns' hypothesis is supported by the fact that in the section examined histologically a small cyst lined with ciliated epithelium and not in contact with the tracheal lumen was found in the depth of the new structure. That this was a cyst of the respiratory tract was evidenced by the presence of a basal membrane.

FRIEDBERG (Z).

Purcell, C. E., and Acree, J. B.: Membranous Obstruction of the Bronchi, Clinically Diphtheritic, with Repeated Removals with the Bronchoscope — Recovery: Apparently Two New Triumphs for Bronchoscopy. *Laryngoscope*, 1921, xxxi, 704.

Purcell reports the case of a child on whom a tracheotomy was performed for laryngeal obstruction due to what was diagnosed clinically as diphtheria. Following the tracheotomy a membranous exudate occluded the bronchi. This was removed through the bronchoscope four times. Once when the child was apparently dead it was revived by artificial respiration induced through the bronchoscope. Recovery resulted.

The following conclusions are drawn:

1. Tracheotomy is the operation of choice in laryngeal stenosis due to membranous obstruction.
2. Stenosis due to membranous obstruction below the tracheal wound may be relieved by the use of the bronchoscope.
3. If there is no laryngeal stenosis and no membrane within the larynx, bronchoscopic removal may be done safely through the mouth and, judging from the case reported, there should be little or no reaction from bronchoscopic removal through a tracheal wound if it is done gently and carefully.
4. In general, the use of the bronchoscope is indicated in cases of even moderate cyanosis unless its cause is definitely known.
5. The use of the bronchoscope is a new method of relieving apparently hopeless cases of asphyxiation in children with membranous obstruction of the trachea or bronchi.

O. M. ROTT, M.D.

Jackson, C.: The Prognosis of Foreign Body in the Lung. *J. Am. M. Ass.*, 1921, lxxvii, 1178.

The author reports the case of a boy aged 17 from whose right lung he removed a 0.22 caliber bullet which had been embedded for fifteen months. The relation of the bullet to the bronchi was determined by mapping the lung. Comparison with transversely

sectioned specimens showed that it did not lie near important vessels. In the preliminary bronchoscopic examination the tissues to be traversed were pinched in order to cause clotting of any vessels which might bleed later, and provision was made for the production of artificial pneumothorax in case it should be indicated to stop hæmorrhage. Tampon tapes for introduction through the bronchoscope were also prepared. Neither of these precautions, however, was necessary.

Under the guidance of a double-plane fluoroscope the bullet was removed in thirty-five minutes. The patient went home on the third day. The author's conclusions are as follows:

The prognosis in cases of unremoved foreign bodies in the lung is grave. Removal by thoracotomy is extremely serious, but bronchoscopic removal is successful in 98 per cent of the cases. The risks of a very rapid and careful bronchoscopic removal without general anæsthesia are almost nil.

In Jackson's case there was no hæmorrhage or fever, and the patient was cured. Bronchoscopic removal is necessarily limited to foreign bodies whose smallest diameter is less than half that of the main bronchus of the invaded lung. Careful lung mapping is necessary to prevent fatal hæmorrhage.

R. C. WEBB, M.D.

Acevedo, B.: Two-Stage Operations for Hydatid Cyst of the Lung (Des interventions en deux temps pour kyste hydatique du poumon). *Presse méd.*, Par., 1921, xxix, 843.

There are three operative methods for the treatment of hydatid cysts of the lung: (1) pneumotomy after surgical pneumothorax, (2) pneumotomy after pleuropulmonary suture, and (3) pneumotomy after the formation of pleuropleural adhesions according to the method described by Lamas.

Pneumotomy after surgical pneumothorax is an excellent operation but requires the use of a general anæsthetic and often gives rise to serious complications. Pneumotomy after pleuropulmonary suture is a step toward the two-stage operation. The author prefers the latter. It is a simple procedure which is usually followed by rapid recovery. Acevedo operates under regional anæsthesia induced without adrenalin. In the first stage of Lamas' method a rib or two is resected and the formation of adhesions between the parietal pleura and visceral pleura is stimulated. In the second stage, which is undertaken about ten days after the first, the lung is opened through the adhesions, the membranes are removed, and the cyst is drained. In both stages the patient is placed in the jockey position devised by Lamas, his body being bent forward and his legs hanging at the sides of the table and supported, if desired, by stirrups.

A particular advantage of the two-stage operation is that a general anæsthetic is unnecessary. When done in one stage, the removal of one or two ribs, the production of a pneumothorax, and exposure of the lung is often dangerous because of complications.

For the removal of hydatid cysts of the hilum of the lung the author believes a special technique is necessary. If they are small, it is best not to operate. In certain cases Forlanini's artificial pneumothorax seems to be indicated to produce compression of the cyst and its evacuation by vomiting.

W. A. BRENNAN.

PHARYNX AND ŒSOPHAGUS

Vinson, P. P.: Œsophageal Stricture Following the Vomiting of Pregnancy. *Surg., Gynec. & Obst.*, 1921, xxxiii, 412.

Six cases of this condition have been observed at the Mayo Clinic. Most of the patients gave a history of the vomiting of pregnancy followed in a few days or weeks by pain and difficulty on deglutition. In some cases the contraction increased until a stomach tube could not be passed. Not infrequently the vomitus was bloody or there was melena. Gastrostomies had been performed elsewhere or were done at the Clinic in four of the six cases for obstruction or hæmorrhage. One patient died following gastrostomy for almost complete obstruction. Postmortem examination revealed a

lesion at the cardiac opening of the stomach which extended upward for 3 or 4 in. The Œsophageal lining was hyperæmic and œdematous. The walls were markedly thickened, indurated, and hyperæmic. Behind the Œsophagus a diffuse area of inflammation and a small amount of pus were found.

The cases all showed a stricture of the Œsophagus, which in the majority was near the cardia, and all were treated by gradual dilatations to 35 or 50 F. This treatment was successful. Dilatation is done at their homes at long intervals.

In a review of the literature no mention of stricture following the vomiting of pregnancy was found. Many cases of spontaneous rupture of the Œsophagus following prolonged periods of vomiting have been reported, and it is very probable that the strictures in this series were due to the same causes. Whether or not Œsophagomalacia, described by Zenker and von Ziemsen in 1878, is responsible for the condition is debatable as all of their cases were those of males who had induced vomiting over long periods of time and they made no reference to a similar condition in females.

O. S. PROCTOR, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Van Zwalenburg, C.: Final Report on a Case of Radical Operation for the Cure of Double Obturator Hernia; Failure. *Surg., Gynec. & Obst.*, 1921, xxxiii, 429.

The author reports a case of double obturator hernia in which an operation he performed about eight years ago completely relieved the colic-like pain for six or seven years. Intense pain and the symptoms of intestinal obstruction then developed but the patient's condition did not warrant a second operation. Death resulted. Autopsy showed a loop of ileum firmly incarcerated in the sac of the hernia into the obturator foramen. There was no strangulation but complete obstruction.

FREDERICK CHRISTOPHER, M.D.

Lienhardt, B.: The Ether Treatment of Peritonitis (Die Aetherbehandlung der Peritonitis). *Schweiz. med. Wchnschr.*, 1921, li, 674.

This article is a critical review of cases reported in the literature and twenty-two cases treated by the author. Pure ether has a very favorable effect on peritonitis. In 101 cases it decreased the mortality, which is usually over 40 per cent, to 27.7 per cent. Its action is chiefly local, causing a reactive inflammation, exudation, the production of immune bodies, and thus destruction of the bacteria.

A cause for prejudice against the method is the fact that relatively often an adhesion ileus follows its use. The constitutional effect of the treatment

is a postoperative analgesia and probably also a decrease in the temperature and increased leucocytosis. The author lays emphasis on the dosage of ether (maximum 100. gm.) on account of the danger of collapse, especially in the cases of children. He holds that the ether treatment should be reserved for only the very severe cases and should not be used as a prophylactic measure. The combination of ether with camphorated oil is not warranted.

DUMONT (Z).

GASTRO-INTESTINAL TRACT

Balfour, D. C.: Surgical Management of Gastric Ulcers. *Ann. Surg.*, 1921, lxxiv, 449.

The observations in this article are based on the results of surgical treatment in 826 cases of gastric ulcer in the Mayo Clinic between January, 1913, and January, 1920, and are intended to point out, as specifically as possible, the relative merits of surgical measures of proved value and some of the indications for the selection of these methods.

Although satisfactory results are obtained in from 70 to 85 per cent of cases of chronic gastric ulcer in which operation is performed, the author predicts better results when more attention is paid to the eradication of focal infection and the employment of postoperative dietary and therapeutic management.

There are four main considerations on which the value of any operation for chronic gastric ulcer should be judged: (1) simplicity, (2) applicability, (3) immediate results, and (4) ultimate results.

The simplicity of an operation depends on the ease with which it can be performed and the soundness of the principles on which it is based. In the author's experience gastro-enterostomy alone, or preferably, combined with cautery excision of the ulcers fulfills these requirements best. Partial gastrectomy, particularly when combined with gastrojejunostomy in "Y," is primarily at a serious disadvantage as the chances of mishap during its performance are too many to warrant adoption of the operation by any but the most skilled and experienced surgeons.

When gastro-enterostomy is indicated there are fewer obstacles to its performance than to that of any other form of operation. During the past seven years it has been used in the Mayo Clinic in 82 per cent of operations for gastric ulcer, excluding gastric resection.

All operations for gastric ulcer have been so perfected that immediate convalescence is rarely disturbed, and complications, such as hæmorrhage, vomiting, and mechanical difficulties at the anastomosis, have been practically eliminated. The average mortality for all types of gastric ulcer, acute, perforating, and chronic, for the past five years has been 2.99 per cent. Partial gastrectomy has been attended with a much higher mortality, but has been employed only in cases of ulcers with serious complications or suspected malignancy.

It is chiefly in relation to the ultimate results that the plea is made for more radical surgery than gastro-enterostomy, and the question is mainly whether or not the disadvantages of gastric resection, particularly its greater difficulty and higher immediate mortality, are outweighed by any superior ultimate results.

The ultimate results may be considered under three headings: (1) relief of symptoms, (2) protection against the recurrence of the ulcer or the formation of a new ulcer, and (3) protection against the development of cancer. Patients who have had relief for a year after operation are very unlikely to have a recurrence. A few who have been completely relieved of their symptoms may suffer from gastric hæmorrhages at a later period; this tendency is greatest in those who reported hæmorrhage previous to operation. In view of this fact it is imperative to deal radically with the bleeding type of ulcer. Of the patients who did not obtain a completely satisfactory result from operation, very few have not obtained a greater measure of relief than they had secured from previous medical treatment. Protection against recurrence can best be afforded by thorough eradication of all septic foci and by proper postoperative dietary and therapeutic measures.

Cancer has been known to develop during a seven-year period in thirty-three of 799 cases of gastric ulcer in which operation had been performed in the Mayo Clinic. This condition developed after every type of operation and apparently with no less frequency following partial gastrectomy than fol-

lowing knife or cautery excision and gastro-enterostomy. No operation for gastric ulcer will give absolute assurance that the patient will not die from gastric cancer. This entire question of subsequent results in relation to the different operations needs continued study.

Ulcers of the lesser curvature, including those closely associated with the lesser curvature on the anterior or posterior wall, comprise almost 90 per cent of all gastric ulcers. According to the experience at the Mayo Clinic, small ulcers of the lesser curvature—that is, ulcers with craters less than 1 cm. in diameter—are best managed by cautery excision and gastro-enterostomy. Satisfactory results are obtained in more than 80 per cent of cases and the operative mortality is only 1.8 per cent. Because of the technical difficulties, because the amount of healthy stomach removed is out of all proportion to the size of the ulcer, and because of the efficiency of cautery excision combined with gastro-enterostomy, gastric resection is certainly not warranted for small high-lying ulcers.

Ulcers larger than 2 cm. in diameter with extensive induration and adhesions and indications of possible malignancy require radically different treatment. The best surgical management of these cases is gastric resection when proof of malignancy is established; gastric resection, if it can be performed without an abnormally high mortality, when there is strong suspicion of malignant degeneration; radical cautery excision and gastro-enterostomy if the resection cannot be performed without an abnormally high mortality; and cautery excision and gastro-enterostomy in all other cases except those of ulcer so near the cardia that access is too difficult. In the latter, gastro-enterostomy alone will often give surprisingly good results. In cases of very extensive ulcer the value of jejunostomy should be remembered.

Ten per cent of gastric ulcers occur on the posterior wall, and 75 per cent of these are in the pars media. The technical difficulties of treatment are much greater and the results less favorable in this type of ulcer. The stomach and the pancreas must be separated. This is accomplished by various approaches, such as the transgastric, through the gastrohepatic omentum, or through the transverse mesocolon. W. J. Mayo has recently stated his preference for the gastrohepatic route. After the ulcer has been separated and specimens have been removed for microscopic examination the edges of the opening in the stomach should be removed with the cautery, the raw surfaces of the pancreas seared, the opening in the stomach closed, and a gastro-enterostomy performed. Pyloric resection is done when posterior ulcers are near the pylorus.

Ulcers of the anterior wall constitute only 1 per cent of gastric ulcers. If small, they can be excised primarily with the knife or cautery; if near the pylorus, pyloroplasty may be done. For large ulcers of the anterior wall near the pylorus pylorotomy is justified, but it should be remembered that these

"pyloric" ulcers are almost always duodenal and hence not subject to malignant changes.

The indications outlined for the choice of operation are necessarily general, but are based on a careful study of the results of operation for 826 gastric ulcers in the Mayo Clinic during a seven-year period. It seems quite safe to conclude that there is every justification for adhering to the practice of excising the benign gastric ulcer, preferably by means of the cautery, and combining a gastro-enterostomy with the excision. The results reviewed do not indicate that more radical treatment, gastric resection, is preferable in any considerable percentage of cases of non-malignant ulcers. It is encouraging to note that 85 per cent of the patients in this series were traced. More than 70 per cent report complete relief; 10 per cent, improvement; and 4 per cent, no relief.

L. H. FOWLER, M.D.

Eusterman, G. B.: Diagnostic and Therapeutic Aspects of Late Sequelæ of Gastric Surgery: Observations Based on 6,400 Operations for Chronic Gastric and Duodenal Ulcers. *J. Am. M. Ass.*, 1921, lxxvii, 1246.

In this article the factors are considered which contribute to failure or success in the surgical treatment of chronic benign juxtapyloric lesions. As about 70 per cent of all ulcers are duodenal and about 65 per cent of all gastric ulcers are at or near the pylorus and on the lesser curvature, posterior gastrojejunostomy, with or without cautery or knife excision, has been the usual operative procedure at the Mayo Clinic.

Moynihan gives as the chief causes of failure:

1. The performance of a gastro-enterostomy in the absence of an intrinsic lesion of the stomach or duodenum.

2. Faulty technique causing obstruction, too small a stoma, or too long a jejunal loop.

3. Lack of thoroughness in operating, such as neglecting to remove a diseased gall-bladder or appendix or failure to deal directly with an ulcer-bearing area when circumstances warrant it.

4. The formation of a new ulcer at or beyond the stoma, reactivation of a partially healed or unhealed ulcer, or carcinomatous changes in a gastric ulcer not removed at the primary operation.

The author divides the patients whose cases are reviewed into two groups:

Group 1. Almost all of those belonging to this group had been operated on elsewhere and their recurring symptoms were due to: (1) operation in the absence of a lesion, (2) a technical error, (3) gastrojejunal or jejunal ulcer. Secondary operations for the removal of such lesions were performed in forty-four cases.

In the cases of patients operated on elsewhere the diagnosis presents the most difficult problem because of: (1) the lack of authentic operative or pre-operative data, (2) the possibility that the recurring symptoms are due to an original functional or nervous cause, and (3) the difficulty of determining

postoperative complications accurately by the roentgen ray.

Group 2. The patients in this group had demonstrable lesions of the gastroduodenal area which were corrected at secondary operations. Of a total of 6,402 operations of all types for benign ulcers 228 were secondary. There were 4,793 posterior gastrojejunostomies alone.

Gastrojejunal or jejunal ulcer necessitated secondary operation in the cases of fifty-seven patients, forty-nine of whom were males. Pain was located on the left side and lower than before operation. Eighty-eight per cent of these patients had a recurrence of symptoms within one year following the primary operation. The formation of a new ulcer at or near the site of the original ulcer was the occasion for a secondary operation in twenty-one cases. Seventy per cent of the patients of this group had recurrence of symptoms within one year and eight months. The majority of recurring ulcers followed excision or pyloroplasty alone.

Carcinoma developing on benign gastric ulcer treated by gastro-enterostomy alone was found at secondary operation in twenty-three cases. This was previous to the present almost routine use of the Balfour cautery or knife excision combined with gastro-enterostomy.

Answers to questionnaires sent to 2,400 patients showed that 88 per cent have been cured or greatly benefited. Deaver has recently reported cures in 90 per cent following operation for duodenal ulcer. In order to maintain these percentages the surgeon must continue to be conservative in accepting the young male adult with active gastric chemism and the psychoneurotic ulcer-bearing patient if intensive medical management can be the alternative.

In the author's experience the end-results of several hundred well-executed pyloroplasties have not been good, while the results following gastro-enterostomy have been very favorable.

In conclusion Eusterman urges greater co-operation between the internist and the surgeon in order to secure the greatest benefit for ulcer-bearing patients. In the Mayo Clinic the surgeons leave the pre-operative preparation and the details of the immediate and later postoperative dietetics, alkaline therapy, removal of foci of infection, and regulation of the patient's future life to the clinicians.

L. H. FOWLER, M.D.

Finney, J. M. T., and Friedenwald, J.: Pylorospasm in Adults: Its Medical and Surgical Treatment. *Am. J. M. Sc.*, 1921, clxxi, 469.

The authors review the experimental work which has been done with regard to pylorospasm and discuss the diagnosis and treatment of the condition. Eleven interesting cases representing the different forms of the malady are reported.

Pylorospasm is a complex nervous phenomenon the exact etiology of which has not been satisfactorily established. Experiments have shown that it may be produced in rabbits by stimulating the vagus

nerve and inhibited by stimulating the splanchnic nerves. That there is a definite association between this condition and the endocrine system is indicated by the fact that the spasm may be brought about by injecting certain extracts of the thyroid and the parathyroids, and inhibited by injecting an extract from the adrenals. On the other hand there is little question that changes in tonus or peristalsis are of great importance in the production of this phenomenon.

Pylorospasm is of three types: the neurotic, the irritative, and the reflex. In the majority of cases it is secondary to some irritative lesion in the stomach or is a reflex from disease of some other organ. Many of these cases are promptly and completely relieved by removal of the cause, such as an inflamed appendix or gall-stones.

The condition can usually be recognized clinically by a careful study of the case. As a rule, slight if any pathologic changes can be demonstrated about the pylorus at operation as the general anæsthetic usually relaxes the pyloric spasm completely. In the advanced cases various grades of hypertrophy in the pylorus and the pyloric antrum of the stomach may be observed.

The symptoms of pylorospasm are rather characteristic. They consist of hunger pains appearing two or three hours after meals, which are relieved by emptying the stomach and by the ingestion of food; contractions of the stomach leading to tumor formation, which disappear as the spasm relaxes; and symptoms of intermittent stagnation and hyperacidity.

The greatest aid in the diagnosis is the X-ray. By this means the nervous as well as the organic forms may usually be differentiated.

In the treatment of the condition medical measures should always be given a careful trial. If it is secondary to other abdominal conditions the primary disorder should be overcome as far as possible before treatment is directed toward the spasm. The primary neurasthenia is overcome most satisfactorily by dietetic and hygienic measures. During an attack the best results are obtained by lavage of the stomach followed by hypodermic injections of morphine and atropine. The drug most useful in the treatment of this affection is atropine given in full doses. When medical measures fail, pyloroplasty is theoretically the operation of choice and gives most satisfactory results.

FREDERICK CHRISTOPHER, M.D.

Gordon-Taylor, G., and Berry, J.: The Diagnosis and Treatment of Injuries of the Intestines.
Brit. M. J., 1921, ii, 639.

This paper is a very comprehensive summary of the application to civil practice of the accepted teachings of the late war with regard to the treatment of wounds of the intestines.

The authors are agreed regarding the value of early diagnosis and early laparotomy, suture in preference to resection when possible, and local sponging rather than irrigation.

There are three types of intestinal injury due to external violence without penetration: (1) primary rupture of the entire thickness of the bowel wall, (2) secondary rupture, and (3) rupture complicated by other severe internal injury. The diagnosis of intestinal lesion rests on a careful consideration of all the facts and such a case should be considered as a possibly severe intestinal injury.

The symptoms may vary in their order of appearance. Abdominal pain with or without marked tenderness is prominent. Rigidity, vomiting, a rising pulse, and shock may be noted. Berry emphasizes the fact that some physicians are inclined to await the appearance of later signs such as a rising pulse, distension, the presence of gas or fluid in the abdomen, or the absence of liver dullness. Makins lays stress on the significance of localized tenderness, and Moynihan calls attention to the value of Claybrook's sign, transmission of cardiac and respiratory sounds to the abdominal wall. Cape suspects an intestinal injury in a restless or listless patient with a rising pulse even if pain is absent. Berry believes that the diagnosis could and should be made earlier.

The most common cause of intestinal injuries is crushing, and the most common site of the lesion is in the jejunum and ileum. The vital question is whether the abdominal lesion is sufficiently severe to demand exploration. As the early protective contraction of the gut tends to prevent leakage, shock may be delayed.

The treatment advocated is early rapid exploration, preferably under local anæsthesia, with transfusion as a supportive measure if indicated. If the soiling is localized, dry sponging and closure without drainage are best, but if soiling is diffuse, a weak solution of flavine may be employed in the cleansing.

Taylor discusses the experience of surgeons in dealing with penetrating wounds of the intestines at the casualty clearing stations during the war. Previous experience had led primarily to non-operative treatment but in 1915 Richards demonstrated that exploration is the only logical measure and his opinion was vindicated in the latter part of the war. Simple suture is advocated unless: (1) the bowel is practically destroyed, (2) there are several injuries or divisions close together, (3) there is infarction or extensive damage to the mesentery, or (4) there is separation from the mesentery for more than an inch or two.

It must be remembered that the mortality following resection is double that following simple suture, but cases in which resection is required are primarily of a graver nature. It is useless to try to "cobble" a devitalized section of bowel even in cases of profound shock.

The retroperitoneal wound of the large bowel should not be overlooked as it leads early to infection of the cellular tissue and a fatal issue. Colostomy may be of value in such cases if performed early, but if the bowel is badly damaged and infec-

tion has occurred, resection with wide removal of the area and drainage is the only solution. Cæcotomy is of inestimable value in resection of the large bowel.

Cases in which multiple resection is required are in themselves often graver than those which may be treated by less drastic measures. A considerable number are reported in the statistics of civil practice.

Injuries of the duodenum or pancreas and of the bladder combined with an intestinal wound are more serious than those of the ileum or jejunum. Wounds of the jejunum have the best prognosis. Stab wounds in civil practice are probably best explored through the wound after disinfection, but for gunshot wounds an adequate median or paramedian incision should be used. In cases of wounds of the buttocks or thorax, which often involve the abdomen, the prognosis depends on the extent of the intra-abdominal damage done by the missile and by the bony spicules it scattered. A type of injury called a "burst" is a rupture of the smaller vessels to the bowel, especially the more fixed portions of the large intestine, due to traction caused by a missile passing close to the bowel. Gangrenous ulceration of the mucosa ensues, with infection and perforation. Such injuries require resection.

In summing up the question of prognosis, Berry stresses two factors: (1) the lapse of time since the injury, and (2) the amount of extravasation of intestinal contents. He describes a case treated one hundred years ago to show the fallacy of the treatment advocated at that time. J. W. Ross, M.D.

Andrews, E. W.: Duodenal Diverticula. J. Am. M. Ass., 1921, lxxvii, 1309.

Andrews reviews the literature and history of duodenal diverticula. He divides the history of this condition into the necropsy period, in which the condition was viewed as a rare and interesting anatomical deformity whose clinical significance was quite unknown, and the clinical period in which evidence was brought forward to show that these diverticula are important factors in the syndrome of gastro-duodenal ulcer.

To this second period, or perhaps to be classed as a coming third period, belongs the evolution of the operative cure of the condition which is only just beginning, and this in turn seems destined to involve rather wider problems than merely operation upon sacs and diverticula as the pathology is often as mixed and complex as the etiology.

Diverticula are usually single and found most often near the papilla of Vater. They have a smooth lining of mucosa with Lieberkuhn's glands covered by a submucosa and muscularis and Brunner's glands. There is no rupture of the muscular walls. Many theories are advanced for the formation of these diverticula. The author states, however, that we cannot overlook the importance of inflammatory disease and round ulcer in their etiology or ignore their frequency near the head of the pancreas

where, according to Kath, the musculature is weakened by the ducts and large vessels penetrating its wall.

Andrews stresses the fact that the surgeon should make his own fluoroscopic examinations. The treatment is surgical but to date no standardized technique has been adopted. H. A. McKnight, M.D.

Finsterer, H.: Operative Treatment of Acute Duodenal Hæmorrhages Dangerous to Life. Am. J. Surg., 1921, xxxv, 319.

Finsterer believes that operation should be performed during the first twenty-four hours or as soon as possible in even the most severe hæmorrhage of chronic ulcers penetrating into neighboring organs, and that erosion hæmorrhages can never be checked so positively as by resection. Acute hæmorrhage from a duodenal ulcer is always very dangerous, and fatal complications such as perforation and exsanguination may never be avoided with certainty by internal treatment. The author reports 35 cases operated on during the stage of most severe hæmorrhage.

Ulcers of the anterior duodenal wall frequently bleed from one vessel. Pain is increased and the stools are often black several days before the perforation. Hence the perforation may be prevented by early operation. In some cases the ulcer may perforate so rapidly that only immediate operation can prevent it, as shown by one of Finsterer's cases. Another case demonstrates that there may be very severe repeated hæmorrhages from flat ulcers on the anterior wall. It is exceptional for duodenal ulcers to erode the hepatic artery.

In ulcer of the posterior duodenal wall bleeding from the pancreatico-duodenal artery, which is protected only by the peritoneal coat of the pancreas, is particularly severe. Autopsies have demonstrated that death was due to erosion of other than the main branch of the artery. Although hæmorrhage from a penetrating ulcer may occasionally cease spontaneously, the author believes this offers no proof that such bleeding arose from an eroded vessel in the floor of the ulcer, and quotes an illustrative case. As a rule, fatal hæmorrhages arise from ulcers that penetrate the pancreas.

With regard to the clinical differentiation of ulcers of the posterior duodenal wall from those of the anterior wall the author states that an ulcer present for a long period of time and causing almost uninterrupted pain with violent exacerbations which can scarcely be controlled with morphine is probably located on the posterior wall. An acute hæmorrhage in such cases arises doubtless from an erosion of one of the pancreatic vessels. An ulcer of the posterior wall may be indicated also by a positive roentgen finding of a distinct niche. Ulcers of the anterior wall present for many years cause symptoms only periodically and the attacks of pain may be checked by morphine.

Operation should be performed as early as possible because the prognosis depends primarily upon the

anæmia. In the author's cases two methods of operation were employed.

1. The indirect arrest of hæmorrhage by complete exclusion of the ulcer (ligation of the pylorus with simultaneous gastro-enterostomy) and compression of the duodenum by a large tampon. This method is simple but depends for success upon the accuracy of the compression. In ten cases treated by this method there were six cures and four deaths.

2. Resection of the ulcer with direct ligation of the bleeding vessel. This method is not too difficult or dangerous and is more reliable. Resection of the anterior duodenal wall is as easy as resection of the stomach. In cases of ulcer of the posterior wall the wall is detached from the ulcer base, which is left in the pancreas, and the exposed bleeding artery is ligated. In twelve cases of resection (three cases of ulcer of the anterior wall and nine of ulcer of the posterior wall) there was one death (posterior-wall ulcer). This case had been treated without avail for seven days before operation. Of the eleven cured cases, two were operated upon early, and nine after several days of bleeding causing severe acute anæmia, during which time internal treatment was without effect. Resection of half of the stomach was done permanently to remove the hyperacidity and prevent recurrence of the ulcer.

In 131 duodenal resections done by the author the mortality was 4.5 per cent. In the last eighty cases operated upon during the past two and a half years it has decreased to 1.2 per cent. Finsterer believes that by early operation it may be equally reduced in cases of acute hæmorrhage. He favors local to general anæsthesia, and in cases of severe anæmia local anæsthesia combined with the use of a few drops of ether. Large pre-operative doses of morphine are contra-indicated in such cases.

The author's choice of method is resection of the duodenum and half of the stomach, and direct ligation of the bleeding vessel. If the ulcer reaches the papilla of the pancreatic ducts, resection is technically impossible and the hæmorrhage must be checked by the exclusion method and compression.

WALTER C. BURKET, M.D.

Ross, G. G.: The Altered Anatomy and Physiology of the Cæcum and Ascending Colon, the Result of Adhesions. *Ann. Surg.*, 1921, lxxiv, 458.

The most frequent cause of malfunction of the cæcum and ascending colon is adhesions.

In the treatment of such adhesions involving the cæcum with the ileocæcal juncture and the ascending colon consideration must be taken of their extent and location, their anatomical effect due to traction upon the abdominal viscera, and the systemic and local symptoms produced.

The degree of frequency and the extent of the adhesions vary greatly. By reason of their location a few small adhesions may cause more marked symptoms than far more evident structures in some other location.

Adhesions about the cæcum and ascending colon do not necessarily produce symptoms confined to these structures. They may cause interference in any portion of the gastro-intestinal tract. In this connection we must consider, among other conditions, malposition of the stomach with ptosis and fixation of the transverse colon due to adhesions, traction upon the duodenojejunal juncture due to adhesions in the ileocæcal area, possible gastric lesions of an organic character superinduced by malposition due to adhesions lower down, and traction upon the splenic and hepatic flexures by the misplaced transverse colon and fixed ileocæcal region.

The local symptoms are pain about the ileocæcal juncture and hepatic flexure which is more or less constant but has occasional marked exacerbations, tenderness, and a feeling of actual stoppage of the intestinal contents, especially gas, at the hepatic flexure. Fluoroscopic examination often shows a fixed point at the ileocæcal juncture, the hepatic flexure, or both, with delayed passage of the intestinal contents. The referred local symptoms may be so-called dyspepsia without evidence of gastric disease, but with tenderness in the right iliac fossa, vomiting in the absence of any apparent cause in the stomach or upper abdomen, and fluoroscopic evidence of disturbed physiological function of the cæcum and colon.

The functional symptoms are due to delay in the passage of the intestinal contents in the large gut—constipation, intestinal torpor, and distress due to the excessive formation of gas and its slow and painful progress. The systemic symptoms are due directly to this coprostasis causing absorption of putrefactive substances and may range from mere weakness, malaise, listlessness, coldness of the feet and hands, and chronic headache to the most extreme depression with secondary joint and other lesions due to what is practically fæcal infection.

It may be stated broadly that, insofar as treatment is concerned, the cases fall into three groups:

1. Those in which the symptoms due to minor adhesions accompany a general ptosis of the viscera in persons of the so-called neurasthenic type. In these cases the difficulty caused by the adhesions is not the major ailment. Attempts at surgical cure are unfavorable and unsuccessful.

2. Those in which the adhesions themselves are the main or only cause of the symptoms. In such cases it is necessary not only to demonstrate the cause of the general symptoms but also to eliminate the cases in which the intestinal lesion merely accompanies other underlying factors.

3. Those with most severe general symptoms in which the visceral conditions call for extensive surgical procedures such as resection of the colon. Fortunately such cases are extremely rare. The primary mortality is high, and while operation has occasionally given brilliant results the latter have been so few as to discourage frequent attempts.

I. W. BACH, M.D.

McKay, W. J. S.: A Simplified Sacral Proctectomy.
Med. J. Australia, 1921, ii, 365.

McKay has devised a simplified proctectomy which, with the Quénu operation, he has performed over twenty times. While the original Kraske operation used to take him over two hours to perform, he is able to finish all the steps of his own operation, to the point where he is ready to tie off the vessels and sew up, in thirty minutes.

He does an inguinal colostomy two weeks before attempting the sacral step. In this he cuts through the bowel at once and fixes both ends in the wound. The operation proper is performed with the patient lying on his left side. The first step consists in closing the anus by running a strong silk purse-string suture around it. The ends of this suture are left long to serve as a retractor. A 12.5 cm. cut is then made across the lower part of the sacrum and another incision beginning in the center of this cut and running forward for a few centimeters is carried around the anus in a circle about 2.5 cm. distant from the center. After proper dissection, the coccyx is removed by means of a chisel. The dense connective tissue of the fascia propria recti is cut through transversely. The operator next turns to the field of operation at the anus and deepens the incision, taking care to avoid injuring the bulb of the penis. The author describes in detail the methods of dealing with the levator ani, the coccygei muscles, and the lateral ligaments attached to either side of the rectum, and the method of closure.

FREDERICK CHRISTOPHER, M.D.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Dunn, A. D., and Connell, K.: Hepatoduodenostomy, with Observations on the Lyon-Meltzer Method of Biliary Drainage. *J. Am. M. Ass.*, 1921, lxxvii, 1093.

In the case of a patient who was known to be without a gall-bladder and common bile duct and whose hepatic duct had been anastomosed to the duodenum the authors placed a catheter so that it led through a fistula into the duodenal recess into which the liver poured its secretions. They then made the following experiments to determine the accuracy of the Lyon-Meltzer hypothesis of segregation of bile:

Experiment 1. Eight days after the hepatoduodenostomy, 50 c. cm. of a 30 per cent solution of magnesium sulphate were introduced by the catheter directly into the duodenum through the duodenal fistula. The typical *a, b, c*, sequence was obtained.

Experiment 2. At the same hour the next morning, prior to the ingestion of food and without the injection of magnesium sulphate, the bile was collected in fractions for two hours through the duodenal catheter. One hundred and ninety cubic centimeters of pale yellow bile of uniform color and consistency were obtained, all fractions alike.

Experiment 3. Three hundred cubic centimeters of 30 per cent magnesium sulphate solution were introduced into the colon through the rectum. The collected bile corresponded to that of Experiment 2.

Experiment 4. A catheter was passed 32 cm. through the duodenal fistula and 100 c. cm. of 30 per cent magnesium sulphate solution were injected into the jejunum. The *a, b, c* sequence was obtained.

Experiment 5. The technique of Experiment 4 was employed except that consecutive instillations of magnesium sulphate were made into the jejunum. The *a, b, c* sequence was again obtained.

On the basis of these findings the authors do not feel justified in localizing disease of the biliary tract on evidence afforded by the Lyon-Meltzer method of bile segregation. Their observations indicate that the *a, b, c* bile-flow sequence obtained in this case was due to the reaction of the liver to the presence of magnesium in the portal blood.

I. W. BACH, M.D.

Judd, E. S.: Cholecystitis, with Special Reference to the Recurrence of Symptoms Following Operations upon the Gall-Bladder. *J.-Lancet*, 1921, xli, 511.

Judd reviews 1,022 operations on the gall-bladder and ducts performed in the Mayo Clinic during 1920. The study of this series of cases suggests the frequency of the recurrence of gall-stones following simple drainage of the gall-bladder.

In disease of the gall-bladder lesions may be present in related portions of the gastro-intestinal tract. From clinical and experimental data it appears that the function of the gall-bladder is probably that of a tension bulb and its removal is not attended by any sequelæ detrimental to health. The addition to the bile of mucus secreted by the gall-bladder and ducts renders it less irritant to pancreatic tissue. The gall-bladder probably has a concentrating function, as shown by Raus and McMaster. Removal of this organ produces dilatation of the extrahepatic ducts and paralysis of the sphincter of Oddi, a fact which suggests how such removal might influence the course of chronic pancreatitis and hepatitis.

The source of infection of the gall-bladder and whether or not the disease involves the gall-bladder or the neighboring structures first has not been settled. From Mann's experiments with chlorinated soda it seems probable that the infection is blood borne. Infection by way of the portal stream and thence by way of the lymphatics or bile is improbable, as is also infection from the duodenum. The gall-bladder itself is probably the first organ involved.

There are four types of cholecystitis recognizable from the syndromes. The first is that characterized by repeated short, sharp attacks of pain associated with infection or stone. The second is a dyspepsia with perhaps intermittent jaundice and some local tenderness. In the third type the gall-bladder may

act as a focus of infection related to a systemic condition. The fourth is a type associated with migraine.

The clinical history is all-important in the diagnosis. The X-ray is unreliable, and the recently advocated drainage methods have not had sufficient trial to warrant their adoption. Operative treatment of infection and stones is uniformly satisfactory.

One hundred and fourteen of 1,022 operations on the gall-bladder and ducts at the Mayo Clinic during 1920 were performed for recurrence of symptoms. In twenty-eight cases the primary operation was performed at the Clinic. In most instances this operation was the procedure of choice, but in some it was the procedure of greatest safety. Seven patients were never free from symptoms. Most of these had had drainage only, which was insufficient to remove the infection. The remainder were free from symptoms on an average of two and one-half years, a fact which suggests that infection or calculus was not present during that time.

In fifteen of the twenty-eight cases the first operation was performed simply to provide drainage, while in seven cases the gall-bladder was removed. In most of these seven cases a stone was found later in the common duct and the fact that some of the patients were free from symptoms for ten to twelve years suggests that there was re-formation of stones in the common duct after the removal of the gall-bladder. In eight cases stones were found in the gall-bladder at the second operation; in two of these no stones were present at the primary operation when the gall-bladder was drained. In nineteen of the cases operated on elsewhere no stones were found and the gall-bladder was drained. Stones were found in all of these cases at the second operation.

Judd states that these cases substantiate his findings in an earlier series. He emphasizes the fact that the risk of further trouble is reduced if the gall-bladder is removed and questions the possible function of an infected gall-bladder not removed. There is no doubt that stones form in the common duct after the removal of the gall-bladder, and exploration of the duct would not obviate this. Associated disease of the liver and pancreas offers a problem in the study of gall-bladder lesions.

J. W. Ross, M.D.

Meyer, W.: Chronic Cholecystitis Without Stones; Diagnosis and Treatment. *Ann. Surg.*, 1921, lxxiv, 439.

The author discusses all the factors considered in the diagnosis of chronic cholecystitis without stones. The history, the study of the gastric contents, the string test with the use of the duodenal bucket, the examination of the feces, the Wassermann test, radiography, and fluoroscopy are all of importance. Meyer believes that when once the diagnosis has been made cholecystectomy may be conscientiously and emphatically advised.

A glistening, bluish, soft, and non-adherent gall-bladder may be diseased and harbor pathogenic organisms within its walls. In view of the fact that

bacteria are frequently discovered in the center of gall-stones, we can understand how it is that cholecystitis without stones is the precursor of cholecystitis with stones. Cholecystectomy in cases of cholecystitis without stones is therefore a prophylactic operation.

Repeated direct visual inspection of the gall-bladder during operation with the tube in place and the instillation of a 25 per cent magnesium sulphate solution into the duodenum have failed to show the slightest physical contraction of the viscus, even during a period as long as twenty minutes. The Meltzer-Lyon test has little, if any, value in the diagnosis but promises to be of great importance in the treatment of diseases of the biliary system.

The Perthes incision is favored by the author in the cases of strong male patients. He believes also that it is best to advance the gall-bladder fundus toward the common duct in the course of a cholecystectomy. This will enable the surgeon to meet possible anatomical variations as regards the blood vessels and the cystic duct and to place the ligature of the cystic duct close to the common duct, thus preventing the later formation of a miniature gall-bladder which some authors claim they have observed after extirpation.

Temporary drainage of the abdominal cavity after cholecystectomy is considered an absolute necessity. Air-tight suture of the peritoneal sac means taking chances with the patient's life as the ligature of the cystic duct might give way a few days after the operation and the leakage of infected bile would cause peritonitis and death.

Knowing before operation that the bile is pathologic, the surgeon will cut down on the gall-bladder and pull up the cæcum with the appendix, instead of cutting down on the appendix and then palpating the gall-bladder region.

Inspection and palpation of the gall-bladder during operation should no longer constitute the only indication for cholecystectomy. The quality of the bile determined systematically with the help of the duodenal tube previous to the operation and, if desired, the condition of the bile aspirated from the gall-bladder during the operation should guide the surgeon in his decision as to where to incise and what to excise.

FREDERICK CHRISTOPHER, M.D.

Greig, D. M.: A Case of Adenoma of the Bile Ducts. *Edinburgh M. J.*, 1921, n.s. xxvii, 145.

The important points in the history of this case were as follows:

The patient was a woman 44 years of age who had had eighteen pregnancies. The Wassermann test was negative. Jaundice developed in 1917 and persisted up to the time of operation in 1920 but showed no increase in the depth of the color. There had been no loss of weight and no colic. The gall-bladder seemed to be palpable. The stools were practically devoid of bile. The urine was dark colored but not as dark as that in cases of complete obstruction of the bile ducts.

The absence of active gastric disturbances seemed to rule out disease of the stomach, and the presence of gall-stones seemed improbable because of the patient's freedom from colic. The absence of emaciation and anæmia, the slow course of the condition, and the jaundice which did not become intensified did not fit in with a diagnosis of malignancy.

At operation the gall-bladder was found collapsed and the surrounding organs appeared normal. What had been felt and believed to be the gall-bladder was a cystic swelling which bulged behind the peritoneum above the pancreas and pressed against the cystic and common ducts. This was incised and found to contain viscid bile-colored fluid. The character of the fluid did not suggest a pancreatic cyst. The inner surface of the cyst wall contained numerous round cystic elevations. A portion of the cyst wall was removed for examination. A drainage tube was inserted and nineteen days later the patient went home. A perfect recovery was obtained.

The examination of the tissue removed showed an epithelium suggesting bile-duct origin. Its appearance was similar to that of an adenoma of bile-duct origin in which the lumina of the acini or bile ducts had become dilated to form one large and several smaller cysts. In the wall of the cyst a slow inflammatory fibrosis had taken place, causing compression atrophy of the gland elements at the base of the cyst.

I. E. BISHKOW, M.D.

Walton, A. J.: Reconstruction of the Common Bile Duct. *Brit. J. Surg.*, 1921, ix, 169.

Cases in which the common bile duct is obstructed or destroyed and cholecystenterostomy is unadvisable or impossible may be grouped as follows: (1) accidental injury and removal of a portion of the common duct during cholecystectomy; (2) injury of the hepatic or common ducts due to absence of the cystic duct; (3) certain cases of early chronic pancreatitis; (4) certain cases of advanced chronic pancreatitis; (5) combined carcinoma of the gall-bladder and common duct; (6) certain cases of carcinoma of the head of the pancreas; and (7) obstruction of the common duct by scar tissue.

The foregoing conditions have been treated by the following operations:

1. Direct suture, which is usually feasible only immediately after division of the duct.

2. Lateral choledcho-enterostomy which is possible when the duct is much dilated or the obstruction is low down and there is no fistula. The operation angulates the duct and duodenum, causing strain on the suture line.

3. Reconstruction of the common duct by various methods: (1) hepatico-enterostomy (against this is ascending infection, bleeding from the liver edge, and difficulty in suturing the intestine to the liver); (2) anastomosis between the fistula and duodenum (a fæcal fistula often results and the newly formed wall is fibrous and contracts); (3) direct implanta-

tion of the duct into the duodenum or jejunum as first done by W. J. Mayo; (4) indirect implantation (Sullivan inserts a tube into the proximal end of the duct and implants the distal tube end into the duodenal wall. The free portion of the tube is surrounded with omentum. The tube is held in non-contractile tissue and is not apt to pass. The wall, being omentum, forms a fistulous tract, and stenosis and recurrent obstruction may result).

The author describes the technique of his own operation published in 1915. The common bile duct is exposed through an upper right pararectal incision and the upper border of the duodenum is drawn upward and anchored in order to shorten the distance to the end of the duct. As large a tube as possible is fastened into the duct with plain catgut and a flap is cut from the anterior surface of the duodenum and turned downward. The upper part of the resulting opening is sutured until it is only large enough to admit the lower end of the tube. The tube is inserted and the duodenal flap then turned upward. The tip of the flap is united to the end of the duct, the upper lateral flap edges are sewed around the tube, and the lower flap edges are stitched to the duodenal wall which lies immediately behind the tube. For safety, a small drainage tube is placed down to the line of union. The mucous membrane lining is impervious to the action of bile and will not contract. The tube lies obliquely over the duodenal surface and has a valvular action. It is fastened with plain catgut, which rapidly absorbs and permits the tube to pass. When obstruction in the common duct is low down, the author inserts the tube in a lateral slit in the duct and sutures the duodenal flap over it. The new duct makes an angle with the original duct, but the results have been satisfactory.

Ginzberg and Speese's cutting of the duodenal flap so that it turns upward instead of downward is more difficult and less efficient physiologically as it angulates the pedicle.

Walton summarizes his own cases as follows:

1. There were four cases in which an injury was overlooked or some method other than reconstruction was used. In three cases in which some form of repair was carried out there was one death and one shows evidence of further obstruction. In six cases in which reconstruction was done the results were favorable.

2. In three cases in which the new duct was joined to the end of the divided duct there was one death, that of a patient with carcinoma of the common duct and gall-bladder who died after resection of both carcinomata and reconstruction of the duct. The two other patients are in perfect health after four years and eighteen months respectively.

In three cases in which the new duct was united to the side of the common duct there was one death, that of a patient with advanced pancreatitis who died seventeen days after the operation although the tube had passed and there was no evidence of leakage. The two other patients made an operative

recovery but are not free from symptoms because one has an incurable carcinoma of the common duct and the other has advanced chronic pancreatitis.

WALTER C. BURKET, M.D.

Delatour, H. B.: Traumatic Pancreatitis. *Ann. Surg.*, 1921, lxxiv, 435.

Abdominal traumatism is accompanied by injury to the pancreas in only a very small proportion of cases. The case reported in this article was the first observed by the author in thirty years of continuous hospital experience in two hospitals which receive a large number of severe accident cases daily.

In this instance the rear wheel of a wagon passed diagonally over the abdomen of a boy 13 years of age. The symptoms of shock were slight. There was no distention of the abdomen, no muscular rigidity, no dullness in either flank, and no sign of internal hemorrhage. Moderate tenderness to pressure was found in the epigastric region, and after about eighteen hours, in which periodic vomiting occurred, there was evidence of fluid in the abdomen.

Operation was performed twenty-four hours after the injury. An incision made to the right of the median line in the upper abdomen gave issue to considerable blood-stained fluid and a few blood clots. No injury to the small or large intestine, the spleen, or the liver was evident. The region of the duodenum was very edematous and blood stained. On further exploration the head and about one-half of the remainder of the pancreas were found to be lacerated and contused. The pancreas was exposed through the lesser omentum, and three iodoform cigarette drains were carried down to the injured tissue and brought out through the original incision. The wound was closed in layers. During the exploration very extensive areas of fat necrosis were observed in the omentum.

For several days following the operation there was a profuse sanguinous discharge from the drains which was very irritating to the skin. On the eleventh day the discharge had become very much less and all the drains were removed. From then on until the fortieth day there was vomiting, associated with abdominal pain, and fever. A diagnosis of pancreatic cyst was made. Through an incision in the back just below the twelfth rib, 2 in. to the right of the spine, a mass was found just internal to the upper lobe of the kidney. When this was incised about 3 pts. of clear fluid were evacuated. A drainage tube was inserted and the wound closed around it. The patient's recovery has been uneventful, and there has been no recurrence of symptoms.

The author considers the posterior incision as the simplest and best to drain cysts or abscesses of the pancreas. If the diagnosis is not made before exploration it is better to close the anterior incision and approach the tumor through an incision parallel to the lower border of the twelfth rib of the side on which the tumor is most prominent.

FREDERICK CHRISTOPHER, M.D.

Ochsner, A. J.: Drainage of Abscess of the Pancreas. *Ann. Surg.*, 1921, lxxiv, 434.

The author describes a satisfactory method of draining an abscess of the pancreas. In a case reported an exploratory laparotomy demonstrated an indurated mass 5 cm. in diameter in the posterior wall of the stomach, which was attached to the tail of the pancreas. This swelling contained fluid and evidently was an abscess which had formed in the tail of the pancreas from an infection originating in a perforated gastric ulcer.

Through an incision 5 cm. long in the left flank immediately below the last rib a pair of forceps, guided by one hand, was passed forward into the abdominal cavity to a point behind the pancreas. The blades of the forceps were spread widely to establish a broad passage. The space behind the pancreas was then loosely packed with gauze, in the middle of which a large rubber drainage tube was placed. The gauze and the drainage tube were passed out of the wound in the flank and two cigarette drains were carefully placed behind the pancreas.

Five days after the operation the abscess broke spontaneously and a large amount of thick pus escaped. The gauze and the cigarette drains were removed gradually. The rubber tube was left in place for two weeks, when the discharge had been greatly reduced. Following the removal of the tube the wound healed in two weeks.

The author states that if the abscess had not opened spontaneously it could have been opened safely after adhesions had formed around the gauze tampon by forcing into it long dressing forceps passed through the large drainage tube.

FREDERICK CHRISTOPHER, M.D.

Sweetser, H. B.: Splenectomy in Third-Stage Banti's Disease; with Report of a Case of Fifteen Months' Standing. *Surg., Gynec. & Obst.*, 1921, xxxiii, 376.

Comparatively few cases of the terminal stage of splenic anæmia, the so-called Banti's stage, have been treated by splenectomy. True cases of the Banti syndrome show an enlarged spleen and cirrhosis of the liver with ascites. The etiology is unknown.

In an analysis of forty-two cases in which ascites was a complication of enlargement of the spleen the author found that the mortality after operative treatment was 26.5 per cent while that following medical treatment is 100 per cent. Fifty-five per cent of the patients survived operation and remained in good health for more than fifteen months. Sweetser reports a successfully treated case in detail. He summarizes his article as follows:

1. Splenectomy offers the best chance of recovery from the otherwise fatal terminal stage of splenomegaly.

2. A plea is made for detailed histories of all cases of this type subjected to splenectomy, and also for subsequent reports of progress at a date sufficiently late after operation to indicate the ultimate result as regards the permanency of the

cure. Only in this way can judgment be formed as to the value of this procedure.

3. In the study of the blood findings it is not sufficient, from the standpoint of prognosis, to record the differential white count; a more intensive study of the cell structure itself is essential.

FREDERICK CHRISTOPHER, M.D.

Ritter, L.: The Clinical Picture and the Site of Aberrant Pancreatic Anlages (Zum klinischen Bilde und Sitz versprengter Pankreaskeime). *Beitr. z. klin. Chir.*, 1921, cxxiv, 157.

Tumors having their origin in aberrant pancreatic anlages are not rare abnormalities to the pathological anatomist, but have been seldom described in the literature by clinicians and surgeons. The author reports a case observed by himself which was successfully operated on in the Cologne clinic. He also reviews comprehensively all the published cases. According to Opie, cases in general may be divided into two large groups, those in which the tumor is situated above the pancreas in the stomach and duodenum, and those in which it is below the pancreas, in the duodenum and jejunum. However, as this distinction cannot always be sharply drawn, the author separates all accessory glands up to and including the first jejunal loop from those lying further down nearer the ileocaecal valve.

In the case observed by Ritter the family history was negative and the patient had been well up to his fifteenth year. Gastric pain then began, associated with salivation, intestinal rumbling, and a sensation as though the viscera turned over. These colicky attacks, which were sometimes very severe, occurred with no regularity at more or less extensive intervals. At each attack the abdomen became greatly distended so that the clothing was too tight.

On examination the region of the stomach was found to be only slightly sensitive and there were no particular findings to be had by palpation. Chemical examination of the gastric juice showed, as in all other cases observed, a considerable reduction in acidity. The X-ray showed a broad stomach with the pylorus drawn out something like a pedicle. After two hours a finger's breadth of residue from the test meal still remained.

At operation a tumor the size of a bean was found in the upper horizontal portion of the duodenum

about 2 cm. from the pylorus and at the lower margin of the duodenum, firmly adherent to the latter. In shelling it out the mucous membrane was opened but was closed again at once by suture. Since the duodenum was narrowed by the suturing, a posterior gastro-anastomosis was performed and the pylorus closed. Healing took place without complications, all previous symptoms disappeared, and there was a considerable gain in weight.

The author is unable to explain the extremely severe pains but assumes that they might have been due to the growth of the accessory gland since up to the time they began the aberrant anlage remained entirely symptomless. Other possibilities are that the muscles contracted strongly in an effort to expel or overcome the tumor; that in the stage of secretion the anlage caused painful contractions as it increased in size; and that chemical or infectious stimulation of the anlage was responsible.

The occasional malignant degeneration of an anlage has been mentioned by several authors, but such instances are rare. The author reviews the few cases reported in the literature. The article is concluded with a discussion of the frequency of pancreatic tumors in the various segments of the intestine based on sixty-three cases from the literature.

BODE (Z).

Eccles, W. M., and Freer, G. D.: Enlargement of a Splenculus to the Size of a Normal Spleen After Removal of a Ruptured Spleen Ten Years Previously. *Brit. M. J.*, 1921, ii, 515.

In 1910 a man aged 21 sustained a violent blow over the spleen. The spleen was removed after exploratory laparotomy had disclosed a rupture, the incision being enlarged by sectioning the left rectus muscle. The spleen weighed 13 oz. and was ruptured on the inner side in the region of the hilus.

Eight years later the patient developed an evening temperature and was easily fatigued. It was thought he might be suffering from tuberculosis in obscure form. In 1920 the abdomen was opened for the repair of a ventral hernia which had developed at the site of the former operation. A normal appearing spleen having a notch and a hilus with a well-developed pedicle was found in the usual situation. It is rare that such an enlarged splenculus is seen during life.

J. W. ROSS, M.D.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Pewny, W.: The Results of Blood Examinations in Osteomyelitis (Ergebnisse von Blutuntersuchungen bei Osteomyelitis). *Wien. klin. Wchnschr.*, 1921, xxxiv, 110.

The total number of leucocytes is frequently considerably increased (up to 17,000); also that of the polynuclear neutrophiles (to 89 per cent, 14,000).

The number of lymphocytes is usually considerably decreased (to 5 per cent, 450) but in a few cases of tuberculous habitus is increased. The behavior of the eosinophiles is inconstant. The mononuclear leucocytes, like the neutrophiles, are usually increased (to 13 per cent) as is the case in other inflammatory processes.

From two to three weeks after sequestrotomy the leucocytes usually decrease, the lymphocytes approach normal, and the eosinophiles increase.

Shortly after operation there is a marked rise in the number of leucocytes in which all cells participate. A few hours after the changing of a drain a high leucocyte count was observed, which perhaps was due to stimulation of the bone marrow. Before the lighting up of a new focus the number of leucocytes decreased. The number of red cells and the amount of hæmoglobin are frequently reduced for quite a time after operation. The increase in the number of leucocytes does not always correspond to the size of the sequestrum or the amount of pus present. The patient's resistance is an important factor.

DEUSCH (Z).

Léri, A.: Clinical and Therapeutical Remarks on Contractures Following War Wounds. *Am. J. Surg.*, 1921, xxxv, 275.

The author divides contractures following injuries of the limbs into two groups, true contractures of psychic or reflex origin, which are not entirely resistant to passive traction, and pseudo-contractures due to fibrous adhesions, musculo-tendinous retractions, etc., which are entirely unreducible.

Some contractures are functional and without any organic lesion to account for them. Aside from talipes equinus and equinovarus, nearly all contractures of organic nature are in flexion; functional contractures are often in flexion, and contractures in extension are in all probability functional.

Peripheral wounds do not give rise to organic contractures of the leg in extension. Extension of the leg is one of the easiest attitudes to adopt and to hold. A common functional variety of contracture in extension is seen in the hand and fingers. Sometimes the fingers are stretched and spread, either all of them or groups of two or three.

Cases of organic contractures following war wounds may be classified in three groups:

1. Those in which the projectile passed at the level of, or in close proximity to, the contracted muscles, such as cases in which the biceps in the arm or the posterior muscles of the thigh are contracted. These are considered due to musculo-tendinous contractures or muscular fibrosis. An Esmarch bandage will relax contractures but not pseudo-contractures. In cases of war wounds the X-ray often revealed fragments of metallic substances in the muscles.

In some instances the irritative material consisted of small particles of bone, and in others there were small scars. Others showed contractures due to irritation of the nerve supplying the contracted muscle. The author here reports the case of a man with a bullet wound between the middle of the spine and the left scapula. The bullet was removed from the upper border of the sternomastoid, two finger-breadths above the left clavicle. Persistent contracture of the long supinator led to investigation which revealed a hard mass at Erb's point. This proved to be the callus of a fractured rib moved upward. Léri states that since we have learned that the innervation of a muscle is individualized on a

certain portion of the circumference of a nerve, the persistent contracture of one muscle is explicable.

2. Cases of contractures due to organic causes. When the X-ray reveals a foreign substance which cannot be removed, such as metallic duct, slow traction is first begun with the Esmarch bandage. If the patient consents to general anæsthesia much more can be accomplished. In a great number of such cases immediate reduction fails. If the contractures recur after anæsthesia has been induced muscular re-education is resorted to and continuous traction is employed.

3. Cases of contracture of muscles antagonistic to paralyzed muscles. This contracture occurs nearly always when treatment has not sufficiently isolated paralyzed from non-paralyzed muscles.

JOHN MITCHELL, M.D.

Meyer, W. C. B.: Cystic Disease of the First Rib Causing Paralysis. *Brit. J. Surg.*, 1921, ix, 224.

The author reports the case of a man, aged 52, who complained of a swelling in the left supra-clavicular region about the size of a tangerine orange, wasting of the left hand, numbness of the inner side of the forearm and hand, and pain behind the left shoulder and down the inner side of the left arm and elbow. The X-ray examination showed the left first rib to be expanded, irregular in outline, and full of cystic spaces, particularly its posterior half. The left transverse process of the first dorsal vertebra also had undergone cystic change. In addition to the shadow cast by the superficial tumor there was a shadow due to a second deeper tumor involving the area of the cupola of the pleura.

Operation established the diagnosis of hydatid disease of the first rib. The pathologic report on the material removed was, "daughter cysts of varying sizes: from these the scolices of *tænia echinococcus* were obtained."

Five months later the patient had protopathic and some epicritic sensation throughout the previously anæsthetic area and complete relief from pain. The electrical reactions were improved.

FREDERICK CHRISTOPHER, M.D.

Lance, M., Andrieu, J., and Cappelle, F.: Remarks on Juvenile Deforming Osteochondritis of the Hip (*Remarques sur l'ostéochondrite déformante juvénile de la hanche*) *J. de chir.*, 1921, xviii, 471.

There has been much difference of opinion with regard to the end-results of the deforming osteochondritis of infancy—as to whether or not it is the cause of the coxa vara of adolescence and the deforming osteo-arthritis of the adult.

The authors have endeavored to solve this question by the study of five cases treated by them. The oldest of these cases was treated in 1907, and the most recent, in 1914. All of these patients still have some degree of anatomical deformity of the hip, a limp due to shortening and limitation in the movements of the hip, and muscular atrophy.

Therefore, instead of a benign condition which can be cured completely by immobilization, juvenile deforming osteochondritis is a condition with a dubious prognosis as regards the function of the hip.

The authors state that there is not necessarily any relationship between the hip deformity produced by juvenile deforming osteochondritis and that of juvenile deforming arthritis, and they do not agree with Froelich that the deforming osteochondritis of infancy is the cause of the essential coxa vara of adolescence.

The relationship between deforming osteochondritis and congenital luxation of the hip is complex; in both reduced luxation and congenital insufficiency of the hip there are secondary deformities. While the authors do not say that a deforming osteochondritis might not be produced after the reduction of a luxation, they believe that when the reduction acts as an injury which lights up in the hip a latent affection, especially syphilis, it may be a determining factor in the beginning of the disease, as in a case reported by Elmslie which showed the typical evolution of a deforming osteochondritis following a traumatic luxation.

Deforming osteochondritis leaves a deformity of the hip which resembles the deformity in cases of reduced congenital luxation and to some extent suggests that due to insufficiency of the hip. While this deformity does not lead to the coxa vara of adolescence, it may cause a true deforming and ankylosing arthritis of the hip by secondary inflammatory recurrences. It must not be confused with the deformity which follows epiphyseal erosion of the head of the femur. As both lesions are situated in the epiphysis, their origin can be determined only from their etiology.

The authors have studied also a number of cases of juvenile deforming osteochondritis associated with hereditary syphilis. The results seem to indicate that the possibility of a syphilitic origin cannot be entirely rejected, and that when hereditary syphilis is the cause, energetic and early treatment will no doubt lead to complete recovery from the disease and prevent the secondary deformities of the hip which would render it functionally weak.

W. A. BRENNAN.

Timmer, H.: The Determination of Leg Shortening in Hip Disease (Die Bestimmung der Verkürzung der Beine bei Erkrankungen des Hüftgelenks). *Nederl. Tijdschr. v. Geneesk.*, 1921, lxx, 2507.

The author describes the different methods of determining shortening of the leg in hip disease. The method most in use is that of measuring the distance between the anterior superior iliac spine and the lower border of the internal malleolus. In this procedure mistakes may be caused by unequal abduction, adduction, flexion, rotation, or an asymmetrical pelvis. When in a case of unilateral disease one leg is in a fixed abnormal position, especially

when it is in a fixed adduction position, this measuring is incorrect as the fixed leg is in the way when an attempt is made to bring the normal leg into the same position.

For the determination of the trochanter position there are different methods. First, the use of the Roser-Nelaton line. In this connection it must be borne in mind that neither the trochanter nor the tuberosity of the ischium is an absolutely fixed point. Slight changes in the position of the thigh affect the position of the trochanter decidedly. By repeated examinations several authors have found noteworthy deviations even in normal hips.

Two other methods are those of Bryant and Korteweg. Bryant extends the axis of the thigh above the trochanter and drops upon this axis a line from the spine. With another line he connects the spine and the trochanter. When the position of the trochanter is normal an equilateral right triangle is thus formed. In abnormal conditions the sides are unequal. Korteweg gets a triangle by extending a line from the tip of the trochanter to the vertical line dropped from the spine. This method is supposed to be more exact than that of Bryant because one can feel and measure exactly from the point of the trochanter whereas by the other method one has to decide largely from feeling on the skin. The measurements must always be made on both sides. In a unilateral adduction position with the patient on his back both legs are put parallel in the abnormal position. Because of the adduction, the distance between the spine and the trochanter must have become greater. If now we find that on the abnormal side the distance is the same or that it is less than on the normal side, the trochanter is higher and there is a real shortening.

Schomaker makes use of a connecting line between the trochanter and spine which should intersect the middle line of the body in the region of the umbilicus. If there is a change on one side the lines do not intersect at the same level, one meeting the median line at a lower level than the other. By this method a slight error in the determination of the trochanter point and slight rotation of the leg may cause a change in the point of intersection.

On viewing the patient in a standing position the shortening of the leg gives a different impression: (1) inclination of the pelvis (muscle paralysis and atrophy must be considered); (2) static scoliosis; (3) a slanting position of the dimples near the os sacrum; (4) greater inclination of the iliac crest on both sides; and (5) greater inclination of the spine. By placing different thicknesses of plates under the shortened leg the exact amount of shortening can be determined.

The author determines in every case the distance between the spine and the internal malleolus and then the trochanter position by both the Roser-Nelaton and the Korteweg methods, comparing the results. In the cases of small children with unilateral congenital dislocation of the hip he brings the malleoli to the same level and then determines with the

eye whether a measuring band laid over the two spines runs straight or slantingly.

In conclusion Timmer discusses the measurements in different diseases of the hip and leg. *TMM (Z)*.

Schmidt: The Development of Genu Valgum from Valgus Position of the Foot (Die Entstehung des X-Beines durch die Valgitaet des Fusses). *Ztschr. f. orthop. Chir.*, 1921, xli, 35.

The most common leg deformity after the third year of life is genu valgum. According to the investigations of Schmidt, this condition is always associated with talipes valgus. Genu varum is relatively rare.

Studies of models and the X-ray pictures with regard to the relationship between talipes valgus and genu valgum gave the following findings:

Genu valgum, the deformity in which the lateral angle at the knee joint is lessened, adjusts itself by the transmission of weight toward the outside and thereby brings about talipes valgus. The changes produced in the knee joint are first noticed in the capsule and ligaments, which are so stretched that a flail-joint results. These changes soon lead to characteristic alterations in the bones themselves. The X-ray shows that the principal bone changes take place in the diaphysis of the femur and tibia. The shape of the epiphyses does not differ from the normal. The characteristic bending occurs chiefly in the tibia in children and in the femur in adults. In a large number of cases there is hypertrophy of the lateral cortex of the tibia to meet the new conditions.

The author discusses in particular the rebuilding of the flail-joint and the correction of the genu valgum by recumbency and the correction of the talipes valgus. Treatment along this line completely overcomes the deformity and proves the correctness of Schmidt's theory that genu valgum is a result of untreated talipes valgus.

In most cases the use of inlays which, by high borders, hold the foot firm and in a supinated position, and the wearing of high leather shoes are sufficient. In especially difficult cases, however, a celluloid splint which extends over the joint and holds the foot firmly in a position of supination should be worn during the night. To combat the habitual valgus position of the knee joint the legs should be twice daily held for half an hour by a support with the knee joints in the median position while the feet are held parallel or even in a varus position by an extension on the same appliance. Active exercises and the maintenance of median rotation are of great importance. In the cases of small children and in very severe cases external supports for the entire leg should be worn at night.

GLAESSNER (Z).

Abrahamsen, H.: Koehler's Disease, with Special Consideration of Its Pathogenesis (Koehlersche Krankheit mit besonderer Beruecksichtigung der Pathogenese). *Hosp.-Tid.*, 1921, lxiv, 87.

By "Koehler's disease" is understood an anomaly which appears in the scaphoid bones in the fifth or

sixth year of life which is usually unilateral but sometimes bilateral. Generally there are no prodromal symptoms, but often there is a history of trauma and the child frequently limps and complains of pain and tenderness to pressure in the region of the scaphoid. The muscles of the lower leg become atrophic; in many cases there is an increased arching of the foot with supination. Less often there is a flat-foot position. The only definite proof is the roentgen picture showing an abnormally small or island-like fragmented center of ossification with indefinite borders.

With regard to the etiology the author states that syphilis, tuberculosis, and von Recklinghausen's osteitis fibrosa can be eliminated. Because of the late appearance of the center of ossification and the anatomical position of the scaphoid bone, Schultze, Stumme, Hanisch, and others believe that a compression fracture of an essentially normal bone plays a part. In view of the lack of evidence to prove the Schultze theory, other authors ascribe the condition to a combination of factors; while they admit that trauma may be a direct cause, they believe a congenital postpartum dystrophy of the scaphoid bone is a necessary precedent.

Preiser speaks of a typical traumatic disturbance of nutrition. He assumes a primary tearing of the tissues containing the vessels bringing nourishment to the scaphoid, and draws a comparison to the Kienboeck traumatic malacia of the semilunar bone of the wrist. Aside from the fact that the latter condition is always the result of trauma, there is very little similarity in the X-ray findings. The fact that it has never been proved that a single trauma was the cause of Koehler's disease led Meulengracht to assume that, as in latent metatarsal fractures, repeated trauma and over-exertion may often cause a compression of the scaphoid. Nevertheless, he does not entirely dismiss as a factor a defective anlage or an error in development.

The third theory, suggested by Koehler, is that the cause is an anomaly in development, a dystrophic process, since the affection often occurs on both sides and without a history of trauma. A fracture, according to Koehler, is never the cause.

Abrahamsen had the opportunity to examine a case repeatedly with the X-ray. The patient was a 7-year-old boy. The case history, inspection, and palpation revealed no evidence of Koehler's disease. The first X-ray picture, however, showed that the center of the scaphoid bone was entirely absent. Abrahamsen gave thyroid treatment for two and one-half months, when signs of emaciation appeared. The X-ray then showed a 7 mm. bone nucleus with very irregular contours. After six weeks the nucleus was 9 mm. long. A trauma (as suggested by Meulengracht) could be eliminated with certainty in this case. By means of X-ray examinations over a period of three months the development of a scaphoid with the characteristics of Koehler's disease could be followed. Ossification, which was

delayed, took on growth after the administration of the thyroid preparation.

Abrahamsen sees in this case a strengthening of Koehler's theory. However, he does not deny that, especially when there is over-exertion and compression of the dystrophic bone, trauma may have a secondary action. The cause of the primary dystrophy is still unknown. SAXINGER (Z).

FRACTURES AND DISLOCATIONS

McCarthy, E. A.: Modern Methods in the Treatment of Fractures. *Boston M. & S. J.*, 1921, clxxxv, 469.

Emphasis is placed on the value of repeated X-ray examinations of fractures. The author favors open reduction, especially of fractures of the shaft of the femur, the distal end of the humerus, the forearm, and the patella. He is opposed to the use of foreign materials for fixation of the fragments, preferring kangaroo tendon or chromic catgut.

Fractures of the neck of the femur are treated by the closed method—complete abduction with the limb in full extension and slight inward rotation. A traction orthopedic table is used, and a plaster spica is applied.

After a closed reduction in cases of Colles' fracture the hand is flexed and deviated toward the ulnar side. Massage, baking, and manipulation are begun early. In ten days the cast is removed and the part placed on an anterior wooden splint which remains on until the end of the third week.

Pott's fracture also is treated by the closed method. A cast is applied with the foot rotated inward and at right angles or dorsiflexed.

Patellar fractures are treated by the open method. Holes are drilled laterally in the fragments, and coarse kangaroo tendon is used to approximate them. A chromic catgut purse-string suture is passed through the tendon and capsule. A semicircular incision is used.

The author advocates early treatment of compound fractures to sterilize the wound, to prevent shortening of the muscles and vessels, and to secure approximation of the fragments.

DANIEL H. LEVINTHAL, M.D.

Rixford, E.: On the Mechanics of Production and the Treatment of Spiral Fractures. *Ann. Surg.*, 1921, lxxiv, 490.

According to the author, the results of the treatment of spiral fractures are appalling. Non-union is common and deformities of all types about the ankle and foot are numerous. To obtain better results a proper understanding of the mechanism of the fracture is essential. By a diagram it is shown that unless the fracture is completely reduced it will gap widely along the spiral component. In the majority of cases reduction cannot be accomplished by the ordinary methods followed by fixation, or even by traction. Better results can be obtained in

such cases by early operation before secondary changes have occurred. Barring definite contra-indications to surgical intervention in general, all spiral fractures of the long bones of adults and adolescents and some of those in children can be managed by early open operation. The following technique has given Rixford excellent results:

1. The location and form of the fracture are determined by means of X-ray plates.

2. The spiral part of the fracture is cut down upon and all detached chips of bone are removed. Larger fragments are also removed if they are not necessary for splintage. Both bone ends are drilled, care being taken to disturb the bone as little as possible. The holes are made at points which, after reduction, will make the line joining them oblique to the spiral and increase most effectively the resistance to torsion displacement. In general this line will be transverse to the axis of the bone.

3. A stout silver wire is passed through the drill holes.

4. The fracture is reduced by traction, rotation, and leverage, with care not to break the bone. Any periosteal or fibrous tabs between the fragments along the spiral are removed but care is taken not to strip the periosteum. The wire is drawn taut and twisted, its ends being hammered down against the bone.

4. The wound is then closed and some sort of efficient retention appliance, a properly fitting Thomas splint or a plaster-of-Paris cast, is applied.

6. The retention appliance is removed frequently for massage, mobilization of the joints, and electrical stimulation of the muscles.

F. W. CARRUTHERS, M.D.

Delannoy, E.: Fractures of the Acetabulum Caused by Forcible Central Luxation of the Femur (Fractures de la cavité cotyloïde par enfoncement et luxation centrale du fémur). *Rev. de chir.*, Par., 1921, xl, 317.

The author reviews the literature and reports a case of fracture of the acetabulum produced by forcible central luxation of the head of the femur.

Such fractures occur most commonly between the ages of 10 and 40 years. Their maximum incidence is between the thirtieth and fortieth years. They are produced usually by falls and blows upon the great trochanter—falls in which the patient alights upon his feet, and terrific blows from above upon the shoulders. Fractures of the acetabulum without central luxation of the head of the femur are rare.

Pathologically fractures of the acetabulum may be classed as vertical and horizontal fractures with slight or complete luxation of the head of the femur, and radiating fractures without displacement of the femoral head. Loss of function is not always complete. Movement is accompanied by pain referred to both the pelvis and the hypogastrium. Retention of urine, dysuria, and abdominal contusions are common complications. The limb is held in

flexion, external rotation, and abduction. The degree of rotation depends upon the amount of penetration of the femoral head. Objectively one notes obliteration of the trochanteric prominence and ecchymoses over the trochanter, scrotum, and pubes. Rectal examination often reveals crepitation.

The diagnosis is aided by the X-ray, which reveals luxation of the femoral head and the line of fracture. This lesion must be differentiated from simple contusions of the hip, fracture of the femoral neck, intracapsular fracture, iliac, ischial and pubic luxations, coxalgia, and pelvic tumors. The usual complications which must always be anticipated are injuries to the bladder and rectum, injury to the obturator nerve, pelvic hæmatoma following lesions of the iliac vein, and wounds of the parietal peritoneum.

Early mobilization of the limb with extension followed by massage and passive and active movement are the essentials in the treatment of acetabular fractures without marked luxation of the femoral head. In the presence of luxation, the femoral head may be reduced by external manipulations following the methods of Whitman or Roux or by open operation.

LOYAL E. DAVIS, M. D.

Dunn, N.: Compound Fractures of the Thigh and Leg. *Brit. M. J.*, 1921, ii, 632.

Experience in the treatment of compound fractures of the thigh and leg during the war has emphasized the value of splinting in these cases in contrast to the method of open reduction used for simple fractures. The Thomas splint can be employed for any fracture of the lower limb. Its efficiency is shown by the fact that in one series of 500 cases of fracture of the femur the average shortening was less than $\frac{1}{2}$ in. This splint is easily applied and, by holding the fragments, tends to lessen shock and sepsis.

The author advises preliminary measures such as the treatment of shock, the administration of antitetanus serum, and the early cleansing of the wound followed by primary or secondary suture. Fractures of the upper third of the femur are splinted in flexion and abduction. For fractures complicated by large wounds of the buttocks the Sinclair net may be used.

The technique of applying the Thomas splint in cases of fracture of the shaft of the femur is discussed with emphasis on the methods of obtaining counter-traction and suspension and the use of the Sinclair skate. The position of the fragments should be controlled by frequent X-ray examinations. As soon as there is firm callus motion is obtained at the knee joint by the use of a Thomas splint with a hinge at the knee. A calliper walking splint is used after ten to twelve weeks, but weight-bearing is not allowed until definite trabeculations can be seen through the line of fracture.

For fractures of the tibia and fibula the Thomas knee splint used with traction gives excellent results.

Two points must be borne in mind: correct position of the foot and the normal anterior bow of the tibia. Joint fractures, especially of the knee, must be accurately reduced, by open operation if necessary.

Limitation of motion which so often results in the joints following fractures may be largely prevented by early splinting, the control of sepsis, and early movement of the joint. If ankylosis occurs in the hip, knee, or ankle, a good functional position is essential.

Osteomyelitis following a compound fracture is a different problem. A radical operation should not be considered until late in order that the sequestra may be fully formed and maximum resistance may have been developed.

The author claims that by thoroughly cleansing and obliterating the cavities and draining posteriorly he has obtained a cure in 80 per cent of the cases of fracture of the femur treated by a single operation.

J. I. MITCHELL, M.D.

Peckham, F. E.: The Treatment of Fractures of the Femur. *J. Orthop. Surg.*, 1921, iii, 529.

This article is a plea for simplicity of apparatus in the treatment of fractures of the femur. In a case of fresh fracture of the femur at any point from the top to the bottom traction and counter-traction will pull the leg down to length. Counter-extension is obtained by a padded perineal band attached at the head of the bed to a weight half the amount used for the direct extension. Coaptation splints are used for fractures of the upper and middle thirds. The constant traction will pull the fragments down to length and if they do not then go into apposition it is usually because they are caught in the soft tissues. Only in the latter case is open operation indicated.

Peckham's patients are taken to the operating room in bed with all extension apparatus intact. Incision can then be made and the fragments approximated without removing the patient from the bed or the splints from the leg. When accurately approximated, the fragments usually need no internal fixation.

In fractures of the neck of the femur, extension and counter-extension are also used to bring the leg down to normal length. This requires from two days to two weeks. When a little more than normal length is obtained perfect apposition is effected by strong internal rotation and the use of a T splint and adhesive straps. In order to get a good weight-bearing line and avoid subsequent shortening from a varus position of the neck it is important to have the distal fragment down under the proximal fragment. With this method the results are obtained gradually, no anæsthetic is used, and care of the skin and some freedom of the patient's body are permitted.

Ten case reports are given, and convincing illustrations supplement the article.

WILLIAM A. CLARK, M.D.

Henderson, M. S.: Fractures of the Femur; End-Results. *J. Orthop. Surg.*, 1921, iii, 520.

The records of 222 patients who had come to the Mayo Clinic on account of fractures of the femur were studied. The data concerning those who could not be traced or who were still under observation are not considered in the discussion.

In the fifty-seven cases of recent fractures there were three deaths. One patient died of fracture of the skull the day of the accident; one of pulmonary embolism the day of the operation; and one, a woman aged 50, in the third week after operation from pulmonary embolism following reduction and treatment by the Whitman method. Nine patients had sustained fractures of the neck of the femur; seven were cured. In one case the fracture was improperly reduced and one patient failed to carry out the treatment.

The Whitman method is the method of choice, but in certain cases the Ruth-Maxwell traction method has been used. Seven patients had fractures of the upper third of the femur; all obtained satisfactory results. Fifteen fractures in the middle third of the femur and three of five fractures in the lower third were cured. Three of the cases were epiphyseal separations in children. One of the deaths was that of a boy 9 years of age who died from fat embolism. In forty cases under observation to the end-results the outcome was entirely satisfactory in 87.5 per cent.

The present treatment of recent fractures at the Mayo Clinic is described briefly. The younger the patient the easier the application of conservative measures, although occasionally, even in the cases of babies, difficulty is encountered in engaging the ends of the bone satisfactorily. When this occurs, open operation should be done. In the cases of vigorous adults, under proper surroundings, the open operation and the use of beef-bone or, if necessary, metal plates for internal fixation have been more satisfactory than conservative measures. Under certain ideal conditions of equipment and training conservative measures would probably give equally good functional results.

Proper internal splinting and postoperative fixation of the limb insure a perfect anatomical result. A good fracture table is essential. In the cases of elderly patients the author has generally resorted to conservative measures, but in the future expects to operate more often if the patients are in good general health. This does not apply to those with fractures of the neck of the femur. In such cases the Whitman abduction method gives perfect control of the fragments. As prolonged fixation in plaster tends to stiffen the knee, it is the present practice at the Clinic to put joints in casts which permit early active movement.

Of the 165 patients with old fractures, fifty had fractures of the neck of the femur, and all but six were operated on. Thirty-nine of those traced were operated on, and twenty-eight (71.7 per cent) were cured. The bone-pegging operation is satisfactory

in cases in which a sufficient amount of the neck of the femur is left, but when the neck is absorbed the Brackett operation is preferred. In treating old fractures of the shaft of the femur, whether in the upper, middle, or lower third, operation is usually difficult and may be attended by infection and risk to life. It is hard to estimate the end-results in such cases because a study should be made of individual cases and in some it would be absolutely impossible to obtain perfect results. Patients in whom the maximum of benefit under the circumstances was obtained were classified as cured, the classification being thus based on the personal equation.

The metal plate was used in fifty-eight operations. After a tediously long dissection to expose the fragments, freshen them, and fit the ends of old fractures, the use of metal plates and screws was found to be the easiest and quickest way out of a difficult position. Prolongation of the operation to apply a bone graft is attended with a risk that cannot be lightly considered. The oblique and spiral fractures may often be held easily with beef-bone screws alone, and in cases of transverse fractures the combined use of beef-bone plates and screws is in many respects ideal.

Sepsis is more prone to follow the use of the metal plates than the beef-bone plate or autogenous bone graft. At present every metal plate is removed as soon as union is sufficiently firm to permit such removal. Infection may spoil a well-conducted operation and is a factor to be considered in dealing with the end-results. In the series of cases reviewed infection ran high and occasionally caused failure. More recently, beef-bone plates and screws have been employed and are better tolerated by the tissues.

Postoperative fixation is essential if there is any tension in the muscles of the thigh when the bone ends are put together as the plaster-of-Paris cast is not sufficient to prevent bowing. If there is any question about this, the patient should be put to bed with extension on, a Thomas splint being used and the foot of the bed being elevated.

One hundred and fifteen fractures of the shaft of the femur were treated. Sixty-nine were operated on. Satisfactory results were obtained in fifty-three (76.7 per cent). In twenty-nine cases treated by conservative measures satisfactory results were obtained in 93.1 per cent. It must be remembered, however, that operative measures were employed for the more serious fractures, while non-operative measures, such as manipulations under ether to line up the fragments and treatment by extension and the application of Thomas splints, were employed for the more simple fractures.

In 102 cases in which operation was performed for an old fracture there were two deaths. One woman, aged 38, who had non-union of the middle third of the femur, died the day of the operation, probably from pulmonary embolism; autopsy was not permitted. A man, aged 32, died the sixth day after

operation; autopsy failed to disclose the cause of death. A slight bronchopneumonia and a slightly contracted kidney were found but no evidence of pulmonary embolism. Death was probably due to renal insufficiency. The clinical examination, however, had been negative.

There are two serious complications of clinical significance which stand out in this review, thrombosis of the common iliac artery and dilatation of the stomach. Thrombosis of the common iliac artery is more common in fractures of the neck of the femur than has been believed. It was demonstrated at autopsy in two of the patients who died of embolism, and probably was the cause of the persistent oedema in the cases of some of the patients who, so far as the fracture was concerned, obtained excellent results. Dilatation of the stomach occurs but rarely in orthopedic cases, but if it is unrecognized may cause death.

Lane, W. A.: The Disastrous Results of Certain Abduction Fractures of the Ankle Joint.
Lancet, 1921, cci, 697.

The author's attention having been called recently to the poor results following the surgical treatment of a fracture of the ankle joint which he described many years ago, he discusses the mechanism of fractures in this region and emphasizes especially the treatment of the third-degree abduction fracture.

Fractures of the ankle are caused by adduction and by abduction. There are two varieties or degrees of adduction fracture. In the first, the weight-bearing on the inner articular surface of the astragalus against the internal malleolus splits off the internal malleolus and a wedge of the inner surface of the tibia. The line of fracture is almost perpendicular. The second type includes this fracture and, in addition, a transverse fracture of the fibula over the lower edge of the tibia due to the greater adducting force.

In abduction fractures three degrees are recognized. First, that in which abduction causes torsion on the fibula, which breaks, usually obliquely; second, that in which the internal lateral ligament is torn or the internal malleolus is fractured; and third, that in which the strain on the interosseous ligament tears off a triangular area of the lower end of the posterior part of the tibia, the base of which extends to the articular surface.

It is for the last variety that the author makes a special plea for rational treatment. Unless the articular surface is restored, function can never be regained. This cannot be accomplished by the ordinary treatment of a Pott's fracture.

Lane advises open operation. In the adduction fractures the fragment of tibia is replaced and fixed by a plate. The fibula fragments fall into normal line. In the abduction type the fibula fracture is reduced and held by a plate and the tibial fragments will assume their normal position.

J. I. MITCHELL, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Mayer, L.: The Free Transplantation of Tendons.
Am. J. Surg., 1921, xxxv, 271.

Great progress has been made within the past few years in the surgery of tendon transplantation. Eight years ago Muller expressed the hope that future surgery would be able to replace the loss of tendons by free transplantation and since then a method of doing this has been found.

Among those in this country who are responsible for advances in this field of surgery Bunnell deserves first mention. His method precludes all traumatism. To facilitate the suturing in tendon transplantation Bunnell devised a tendon clamp so constructed that it holds the tendon fibrils firmly together when they are sutured.

In free transplantation the vitality of the transplant depends upon the accuracy of coaptation of tendon to tendon. Gallie and Le Mesurier reported evidence that the transplanted tendon does not undergo necrosis. Others believe the transplant dies and is replaced through the activity of the surrounding tissues.

A knowledge of anatomy and physiology is necessary for the successful transplantation of tendons. The attempt must be made to reconstruct the normal paratenon, a loose areolar tissue rich in elastic fibers which lies between the tendon and fascia. Where the tendon changes direction a sheath is provided as the paratenon is not sufficient protection against the bony impingement of restraining ligaments. The sheath is a sack filled with fluid which acts as a buffer against friction. A valve-like structure, called the "plica," is situated at the upper pole of the tendon. The tendon surface is coated with cells differing morphologically and functionally from the cells of the deeper strata. Injury to them must be avoided if the gliding function is to be maintained. To fix the tendon to bone or another tendon these superficial cells must be removed.

The author reports four cases of tendon transplantation.
JOHN MITCHELL, M.D.

Forrester-Brown, M. F.: A Study of Some Methods of Bone Grafting. *Brit. J. Surg.*, 1921, ix, 179.

The author reports six groups of cases illustrating the advantages and limitations of the different types of operation for ununited fractures. As guiding principles are advocated: (1) wide opening up of vascular bone to give the osteophytes free access to the site of fracture, (2) preliminary correction of deforming tendencies, (3) protection of the bone from undue stress subsequent to the operation, and (4) heavy massage and the use of the protected limb as soon as callus is formed.

The operative methods employed in the treatment of ununited fractures are: (1) freshening of the ends of the bones, with "stepping" to increase the raw surface and to make contact more firm, (2) the use of many small bone chips to supplement

the osteogenetic power of the bone ends, (3) sliding grafts, (4) intermedullary peg grafts, (5) inlay grafts, (6) plating, and (7) grafts of ivory or boiled bone.

In the application of any of the various methods in cases of war injuries the author has found it advantageous to divide the operation into two stages. At the preliminary operation scar tissue and the sclerosed ends of the bone should be removed and contractures corrected. If primary union occurs in two weeks, the bone grafting operation is done. The advantages of such a two-stage procedure are the prevention of mechanical strain on the graft and the avoidance of a flare-up of sepsis.

"Stepping" the ends of the bone is applicable particularly to infected cases of ununited fractures, especially those of the humerus and the femur and occasionally those of the forearm and lower leg.

Small bone grafts or chips taken from the iliac crest may be sutured between the ends of the bone. This procedure gives the maximum of raw bone surface and limits the escape of living osteoblasts to the minimum. Its disadvantages are that it gives no mechanical stability and the chips may be absorbed. They may survive for one or two years, but in the author's cases, while producing new bone, did not cause bony union of the fragments between which they were sown. This method should be supplemented therefore by an inlay or peg graft, and is indicated for large gaps in thick bones and to replace the enlarged end of a bone whose destruction has produced a flail joint.

The formation of a sliding graft is a simple procedure, and as the graft comes from the same bone to which it is applied it corresponds to its host in structure. The disadvantages of its use are that it is not nearly the caliber of the missing part which it replaces and cannot withstand strain. It is indicated for the bridging of short gaps especially in the tibia or radius.

The intermedullary graft is the least desirable as it is often difficult to get the ends of the bone far enough apart to allow the introduction of the peg, and the graft corks the medulla, the source of early callus and the most vascular part of the bone. However, it may be used to advantage to maintain apposition of the ends of the humerus or femur but should be supplemented by a lateral graft.

Inlay grafting is the most satisfactory method of dealing with ununited fractures when there is a considerable gap in the bone. Four essentials are emphasized: that the graft be thick and vascular, that it be applied to as large a raw area in the host as possible, that the maximum area of cancellous bone consistent with stability be exposed, and that the juncture of graft and host be protected from strain until callus unites them. The author believes that the graft may act as a source of new bone. In this connection a case is cited in which the ulna had been bridged by a graft from the tibia. Good union had resulted at the ends of the graft, which was

accidentally broken at its center, a considerable distance from the ends of the ulna. Union was effected in a few weeks by an ensheathing and central callus.

In discussing plating the author states that there is increased danger of a flare-up of sepsis in the use of metal after gunshot injuries, and that the sepsis will continue until the metal is removed, whereas a certain number of bone grafts unite in the presence of sepsis. Because of the rarefaction of bone which develops around metal screws, the screws are apt to become loose and thus fixation is lost. Screws do not promote the growth of bone but rather interfere with union. As some outside fixation is necessary in addition, an absorbable suture is used until the cast is applied. Many of the arguments against metal apply to grafts of ivory and dead bone.

In conclusion the author calls attention to the necessity of considering the bone graft only as a link in the restoration of function. The adjacent joints must be mobilized and tendon transplantation must be done to replace muscles shot away and to mitigate the results of irreparable nerve injuries.

The article is illustrated by 39 cuts.

JOHN W. POWERS, M.D

Nathan, P. W.: The Biology of Bone Development in Its Relation to Bone Transplantation.
N. York M. J., 1921, cxiv, 454.

It is a well-known fact that the skeleton is derived from the sclerotome which originates from the mesoderm. At a definite time and in a definite location ossification is ushered in by vascular invasion as follows:

Over a layer of procartilaginous cells is a layer of connective tissue cells known as the perichondrium, into which a blood vessel pierces, sending branches in all directions on the surface of the cartilage and at the same time invading the central core. Thus the primordial medullary cavity and the so-called periosteal ossification are begun. It is certain that the ossification does not begin until the osteoblasts make their appearance and that these cells appear coincidentally with the invading vascular loop. There are no cells beneath the perichondrium which resemble osteoblasts and the cartilage cells do not resemble them in any way. Therefore it is probable that the bone-forming cells are brought to the ossification point and invade the cartilage with a blood vessel. The osteoblasts are neither changed cartilage cells nor changed connective cells, but cells of independent origin which are deposited under, but do not have any direct connection with, the so-called perichondrium. Thus the perichondrium does not, as is usually stated, become converted into the periosteum.

Nathan further calls attention to the fact that both epiphyseal and membranous bone originate in the same way as the so-called periosteal bone. At a certain time one or more blood vessels from the medullary cavity penetrate and terminate at a variable distance from the joint surface instead of ending at the epiphyseal lines. These bring with

them osteoblasts and thus an epiphyseal center of ossification is laid down. In membranous bone a vascular loop invades the connective tissue instead of the cartilage, but otherwise the center of ossification is laid down and bone formation proceeds as it does in the epiphysis.

In the author's opinion all that is needed to end the controversy regarding the productivity of the periosteum is the understanding that the osteoblasts are the fundamental factors in bone production and that by productivity of the periosteum is meant the cambium layer containing the osteoblasts. In this sense only is the periosteum valuable and capable of forming new bone when transplanted. What is true of the periosteum is true also of the bone; it is not the bone but the osteoblasts which are the influential factors responsible for the success of a transplantation.

F. W. CARRUTHERS, M.D.

Lindemann: Anatomical and Clinical Studies in Free Transplantation of Bone (Anatomische und klinische Studien zur freien Knochentransplantation). *Zentralbl. f. Chir.*, 1921, xlviii, 1194.

The process of organization or regeneration of bone transplants extends over a space of years and has many distinct stages. The first stage is characterized by complete necrosis of all the constituents of the transplanted tissue. The second stage comprises the organization of the transplant. In the third stage the organized tissue, which is constantly increasing and becoming richer in cells, partially breaks up the bony trabeculae of the transplant and builds up a new substance of osteoid character.

Both processes may go on together, but frequently a breaking down is seen first and the building up does not begin until later. After the third stage the process goes on in the same way as the healing of a fracture. The newly formed osteoid substance calcifies and is resorbed. With it disappear more of the trabeculae of the old transplant, and at the same time new bone of normal appearance develops from the stumps of the bone ends.

This process of organization and regeneration is on the whole regular, but may be disturbed by secondary hæmorrhages, inflammation, or mechanical displacement of the joined ends.

VALENTIN (Z).

Stracker, O.: Operation for Rachitic Curvature of Bone (Zur Operation rachitischer Beinverkrümmungen). *Muenchen. med. Wchnschr.*, 1921, lxxviii, 1020.

Marked rachitic curvature of bone has become frequent. Heretofore the most prominent curvature was usually treated by osteotomy and the limb placed in the corrected position in a plaster-of-Paris cast, the procedure being repeated until the correct position was obtained. This treatment requires a half to three-quarters of a year and is expensive and impractical. Springer's procedure—subperiosteal extirpation, treatment of the bone in a vice, and replacement of the bone segments—makes too high

a demand on asepsis; the same objection may be brought against the procedure of Loeffler by which the piece removed is transformed into bone dust. Schepelmann goes so far as to replace the bone by a plug. The methods employed by Anzoletti and Roepke aim at softening the bone by the prolonged use of plaster-of-Paris bandages and following this by correction.

Stracker recommends the following procedure which is used in Spitzzy's clinic: Osteotomy is performed at all the vertices of the curvature, any associated valgus above the knee is corrected by metaphysiotomy, and extension of the limb is obtained by wire or clamps, the plaster-of-Paris bandage being made into a "guiding plaster-of-Paris bandage" with inclusion of the hip joint. At the same time bandage-extension is established in the pelvic region. A plaster-of-Paris boot ("telescope bandage") is applied to prevent swelling of the free portion of the foot. The maximum weight used is 4 to 7 kgm. Internal treatment for the rachitis is given. Extension is continued for only fourteen days. In from four to six weeks there is full consolidation. Complete cure was obtained without fever in every case.

SCHEUR (Z).

Wheeler, W. I. D.: Reconstruction of the Shoulder. *Brit. J. Surg.*, 1921, ix, 247.

The author describes the case of a man 25 years of age whose right shoulder below the acromion process was totally destroyed so that the arm remained attached to the body by only a pedicle on the inner side carrying the main vessels and nerves. The wound remained septic and unhealed for eighteen months. At the time of the patient's admission to the hospital the movements in the hand were strong and free, and he was able to flex and extend the elbow with considerable strength. Numerous scars in the shoulder joint were subjected to massage, radiant heat, etc. to light up any latent sepsis, if such was present, before a major operation was attempted. The author describes the stages of the operation as follows:

Stage 1. Two incisions were made, one just below the acromion process extending forward under the clavicle and backward beneath the spine of the scapula about the cicatrix, and the other encircling the cicatrix below the level of the middle of the shaft of the humerus. These incisions were joined in front and behind so as completely to encircle all the scar. The dissection was slow and tedious as the scar had penetrated deeply into the position corresponding to the shoulder joint. After removal of the scar a deep hiatus was left beneath the acromion process and the upper end of the fractured humerus. The arm hung from the inner flap containing the vessels and nerves like the sleeve of a coat.

Stage 2. The upper end of the humerus was cleaned and divided until healthy bone was exposed, all irregularities being removed. The glenoid cavity was exposed and an effort made to freshen the surface.

Stage 3. A bone graft 9 in. long was removed from the inner surface of the right tibia with an Albee twin saw regulated so as to cut a graft of tight fit for the medullary cavity of the humerus. The graft was driven tightly into the humerus for a distance of 4 in. and the arm abducted and held in such a position that the graft lay along the glenoid cavity, the upper extremity touching the acromion and the coracoid processes. The attempt was made to obtain broad union between the graft and scapula with the arm in slight abduction.

Stage 4. As 5 in. of the graft was without skin, muscle, or other soft tissue covering, an extensive plastic operation was necessary. A large pedicled skin flap was fashioned from the front of the chest and the skin above and below the original incision freshly undermined. This was found insufficient for the graft but ample for the wound area. To replace the destroyed deltoid muscle by transplantation of the pectoralis major outward, as described by Elmslie, the attachment of the muscle to the clavicle was separated subperiosteally, the clavicular portion isolated from the sternal portion, the tendon attachment severed so that the muscle lay quite free except for the pedicle containing the vascular nerve supply, and the detached muscle was swung outward over the bone graft to the acromion process and attached to the clavicle above by a few points of suture. Below, it was sutured to the periosteum and soft tissues around the humerus in about the position where the normal deltoid is inserted. The clavicular portion of the pectoralis major was successfully replaced and the deltoid destroyed.

Good abduction of the arm resulted but ankylosis of the bone graft was aimed at. The muscle graft was used merely to give ample covering to the bone. The skin flap was then sutured in position and the undermined margins were brought into line. The operation occupied two hours. Postoperatively the arm was carefully immobilized on an abduction splint. The stitches were removed in two weeks, and the splint then replaced by an extensive plaster cast. For three months rigid immobilization was insisted upon as is the custom. Subsequently slight stresses and strains were permitted in conjunction with massage and active movement to stimulate growth in the graft.

Fourteen months after the operation the patient was able to hold a vessel weighing $5\frac{1}{2}$ lb. at arm's length during exposure for a photograph. He could use his arm freely and almost place his hand on the back of his head. The scapular movement was increased in range, and the function of the muscles of the upper arm was restored.

The author calls attention to the following four-point points in bone grafting:

1. Loss of density apparent in a graft as shown by the radiograph several weeks after the operation is deceptive and does not necessarily indicate absorption and failure.

2. Final success in bone grafting depends upon the operation of Wolff's law, i.e., "the amount of

growth in a bone graft depends upon the need for it" (Murphy).

3. To provide the necessary strains and stresses it is advisable to allow the graft to function after preliminary fixation for three months.

4. Although not essential, the periosteum should be left on the graft as it is the medium through which new blood vessels enter the graft and the surrounding structures. A periosteum-covered graft is therefore less apt to become absorbed.

5. In old ununited fractures with false joints the bone is sclerosed, non-vascular, and an unsuitable bed for that portion of the graft in contact with this area.

6. In such cases, instead of responding to Wolff's law, a graft becomes attenuated and absorbed or breaks in the critical area five or six months after the operation.

7. In these cases prolonged fixation is particularly favorable. Wide resection of the sclerosed bone is the only remedy when non-operative methods fail. The patient must be resigned to a shortened limb.

8. A graft must not be used to span a gap in the humerus or femur. The freshened ends of the fractured bone must be in apposition and the graft used as a support.

9. The intramedullary peg is most effective.

10. The bone graft has inherent bacteria-resisting properties. Sepsis does not mean the loss of the graft.

11. Absolute fixation of the graft in its bed for about three months, secured either by operation or by splints or plaster, is essential for success.

12. Bone grafting is followed by more uniformly successful results in the treatment of spinal caries in adults than in other conditions.

13. As in tendon transplantation and nerve suture, the operation of bone grafting should be preceded by correction of any deformity.

14. Identical grafts behave differently in apparently similar cases, and no definite prognosis can be given for many months. S. C. WOLDENBERG, M.D.

Ney, K. W.: *A Tendon Transplant for Intrinsic Hand Muscle Paralysis*. *Surg., Gynec. & Obst.*, 1921, xxxiii, 342.

The intrinsic muscles of the hand and foot are the last to show the return of motor power because of their location and the great amount of time necessary for the regenerating neuraxones to reach the end-plates in the muscle fibers. In addition, the atrophy is much more extreme in a muscle of small volume.

When a lesion involves both the median and the ulnar nerves the disability is extreme. In such cases regeneration of the extrinsic muscles is more or less complete in twelve to eighteen months following a successful nerve suture but in a series of forty-two cases of this type in which there was successful restoration of most of the extrinsic muscles the author found only three which showed any evidence

of returning voluntary motor power in the intrinsic hand muscles supplied by these nerves.

Loss of the power to oppose the thumb and fingers is the greatest disability. The fingers are flexed at the interphalangeal joints by the long extrinsic flexors. When the long flexor of the thumb has regained voluntary power the distal phalanx may be flexed, but as the thumb lies inactive against the outer side of the palm this partial function is of little value.

To correct such a disability as this opponens paralysis, the author passed the short extensor tendon of the thumb through a tunnel under the anterior annular ligament and transplanted it into the palmaris longus or, when that muscle was absent, into the flexor carpi radialis. The advantages of this method are evident and Ney hopes for regeneration in the paralyzed muscles which were in no way injured by the operation.

Local anæsthesia is obtained by infiltrating with 1 per cent novocaine with 15 drops of adrenalin chloride added to each 30 c. cm. of solution. Pressure is made over the infiltrated area for five minutes.

The dorsal incision to expose the tendon of the short flexor of the thumb is made from the metacarpophalangeal joint to 3 cm. above the attachment of the extensor ossis metacarpi pollicis, following the line of this tendon running near the palmar side of the anatomical snuff-box.

The palmar incision is made over the prominence of the palmaris longus tendon. The sheath of the palmaris longus tendon is then opened and the tendon divided at the point where it begins to spread out into the palmar fascia. Care must be taken to prevent injury to the median nerve. A pair of curved forceps inserted distally into the bed of the tendon will pass under the anterior annular ligament into the palm of the hand. When the point of the forceps is felt under the palmar fascia a transverse incision is made large enough to permit the forceps to pass through without constriction.

The superficial fascia, including its fat, is undermined over the thenar eminence and the dorsal and palmar incisions are subcutaneously connected while another pair of forceps is passed through this undermined subcutaneous channel. At this point the end of the extensor brevis pollicis is grasped with the forceps and pulled through the channel to the palmar incision. Here it is again grasped with the forceps passing under the anterior annular ligament and pulled under this structure. The thumb being held in opposition and the hand flexed on the wrist, the transposed tendon is united to the tendon of the palmaris longus.

The sheath of the palmaris longus and the skin incision are then closed. The hand and wrist should be held in flexion for about a month.

After the removal of the splints the thumb is held in its abducted and opposed position for about six weeks, the bandage being removed daily for manip-

ulation of the joints. After two months splinting is unnecessary.

The patient should be taught the action of the palmaris longus before operation. After operation he should practice opposing the thumb and fingers.

JOHN R. MITCHELL, M.D.

Perthes: Plastic Reconstruction of the Thumb. Especially When There Is Loss of the Entire Thumb Division (Ueber plastischen Daumenersatz insbesondere bei Verlust des ganzen Daumenstrahles). *Arch. f. orthop. u. Unfallchir.*, 1921, xix, 199.

For replacement of a missing thumb, especially when the metacarpal is also missing, two different groups of operations are used: distant plastic operations (Nicoladeni I and II) and adjacent plastic operations (artificial cleft formation according to Klapp, finger exchange according to Luksch, Spitzzy, and Machol, twisting of the remaining finger after osteotomy of the first metacarpal according to Lauenstein).

The author uses exclusively an adjacent plastic method and describes first his plastic operation when the first metacarpal is retained. This is an artificial cleft formation. When the thumb and index finger are both torn away but the corresponding metacarpals are left, the second metacarpal is either disarticulated subperiosteally through an incision on the thumb side or is amputated subperiosteally near its base in order to make the cleft between the thumb stump and the remainder of the hand as broad and deep as possible. In this way sufficient room is obtained between the two parts and ample skin for the covering of the cleft (in one case the skin from the middle of the hand sufficed, but in others a pedunculated piece from the chest was necessary in addition).

In this cleft formation it is necessary to protect the adductor pollicis which crosses the space. Therefore its origin on the third metacarpal must be subperiosteally freed and pushed toward the base. The metacarpal of the thumb is then mobilized after division of the skin on the dorsal and the volar side and after the adductor pollicis has been anchored. Then follows the covering of the third metacarpal by direct skin suture and of the skin defect on the grasping surface of the thumb either by direct skin suture or, in the same or a later sitting, by means of a pedunculated flap of skin from the chest.

Two patients operated on in the manner described were able, a few months later, to grasp objects and to extend the newly formed thumb. A case in which all the fingers had been lost was operated upon according to the same principles. The second and third metacarpal bones were amputated subperiosteally near the base and an artificial cleft hand was formed as described. This subperiosteal method has the advantage that the origin of the adductor pollicis and of the interossei remains in a periosteal sheath. As the grasping of objects remained imperfect in the third case reported, an osteotomy was

performed on the third and fourth metacarpals near the base and these bones were then dressed in a curved position over a gauze roll in the hollow of the hand until consolidation had taken place. After recovery the patient could easily hold with firmness objects ranging in thickness from that of a lead pencil to that of a broom handle.

The Nicoladeni I method does nothing more than lengthen the thumb part; it does not give it mobility. The Nicoladeni II method gives only slight movement or none. As a matter of fact, the most important movements of the thumb (adduction and opposition) are carried out by the metacarpal bone. Following the use of the author's method the separated metacarpal bone of the thumb retains its natural ability to feel, as is not the case when the distant plastic method is used. This is of advantage especially in the cases of blind persons who are dependent on the sensitiveness of the thumb.

Perthes uses the adjacent plastic method in cases of loss of the entire thumb division (thumb and first metacarpal). In three such cases he worked out a method which is a combination of all three adjacent plastic methods: (1) a split is made between the metacarpal bone of the index finger and the rest of the hand; (2) the second metacarpal is put in the place of the lost first metacarpal in connection with the trapezium; (3) the stump of the index finger, after osteotomy, is given a twist in such a manner that the flexor surface is turned toward the middle of the hand and the flexors act as adductors and the extensors act as abductors.

From an incision beginning between the head of the second metacarpal and the base of the middle finger and extending into the palm of the hand toward the ulna, the second metacarpal is removed, care being taken not to injure the muscles of the ball of the thumb. Another incision is then made on the dorsal side of the third metacarpal. Through these incisions on the flexor and extensor surfaces enough skin is obtained to cover the new thumb. The wound surface on the middle of the hand is covered with a pedunculated flap from the chest wall. The second metacarpal is then luxated and a small piece of the base is resected (if a small portion of the first metacarpal remains, the second metacarpal is not resected but a centimeter from the joint is excised at its base by means of a Gigli saw and split in a longitudinal direction).

By a separate incision in the radial side of the hand the saddle joint surface of the trapezium is exposed and here the correspondingly modeled second metacarpal, twisted to 90 degrees, is inserted so that the inner surface of the index finger is toward the middle finger. In this position the newly formed joint is fixed by sutures forming a sort of joint capsule. With a portion of the first metacarpal this is put in a position of mid-pronation by chiseling and the second metacarpal is brought into the incision and fixed by a periosteal suture. If the second metacarpal is too long to make possible the implantation of the base of the index finger on the trapezium, an

osteotomy is done in its center, after which the implantation is easily accomplished by turning the metacarpal bone.

The freed stump of the flexor pollicis longus is then attached to the flexor tendons of the index finger, the stump of the extensor pollicis longus is attached to the extensor tendons of the index finger, the abductor pollicis longus is sutured to the base of the second metacarpal (the artificial thumb), the freed tendon of the extensor pollicis brevis is fastened to the base, and the tendon of the flexor pollicis longus is fastened to the flexor surface of the second metacarpal. If the tendons of the index finger have already found an insertion in the scar tissue at the head of the second metacarpal, suturing with the thumb tendons need not be carried out as, after a turning of the second metacarpal, they can function both in abduction and adduction.

Then follows the covering of the newly formed thumb by drawing together the dorsal and palmar skin. The wound surface on the third metacarpal is best covered immediately by a pedunculated flap of skin from the chest.

Important in the after-treatment are passive movements, hand baths, and bandaging of the newly formed thumb in abduction with traction to prevent the tendency to adduction contraction.

Three persons operated on according to this method were able to hold large and small objects firmly a few months after the operation. Abduction and adduction were possible to a considerable extent, and the feeling in the thumb was good.

In conclusion the author states that even when the entire thumb is lost the distant form of plastic operation cannot compete with the method just described.

ROHDE (Z).

Báron, A.: Operative Extra-Articular Stiffening of the Hip Joint (Operative extraartikulaere Versteifung des Huftegelenkes). *Zentralbl. f. Chir.*, 1921, xlviii, 1047.

Báron discusses from a theoretical standpoint the possibility of producing stiffness of the large joints extra-articularly by operative means. This is indicated particularly in the cases of children with closed tuberculosis. He has tried the procedure in the treatment of tuberculosis of the hip. This case was as follows:

The patient, an 8-year-old boy, had had pain and stiffness in the left hip for one year and had worn long plaster-of-Paris bandages for six months. There was considerable shortening of the leg. When the patient was examined by the author he was moderately well developed and showed no abnormality of the internal organs. The left hip was in marked adduction, elastically fixed. The head of the femur was displaced forward to a considerable degree and easily palpable. There was marked diminution of function, but no abscess or fever. The X-ray showed marked destruction of the head of the joint and the acetabulum and complete luxatio iliaca.

By means of extension continued for two weeks the head of the femur was almost completely reduced and a position of slight abduction was obtained. Operation was then done. A lateral incision about 20 cm. long was made from the crest to about three finger-breadths below the trochanter. The gluteus medius was separated and the outer wall of the pelvis and the trochanter were exposed. From the outer cortex of the ilium, beginning at the crest, a flap of bone and periosteum 4 cm. in length and breadth was formed with its base downward. This was turned down and fastened. From the outer portion of the femur, or of the trochanter major, a flap of periosteum and bone was then formed with its base upward and turned up and fastened. The two flaps were then joined to each other and their periosteum fixed smoothly to the underlying muscles.

The formation of the femur flap was difficult as the bone splintered and became separated from the periosteum. These free bone splinters were laid again in their proper places upon the periosteum. A flexible flap of bone and periosteum from the right tibia was used to cover the joined pelvic and femur flaps and the areas from which they had been removed so that a firm joining of the three osteoplastic flaps with one another, with the pelvis, and with the femur was obtained and the bone flaps were surrounded almost entirely by periosteum. The gluteus medius and the fascia were joined with strong interrupted sutures of catgut by which the bone flaps received covering and support. The limb was then held in slight abduction by a plaster-of-Paris bandage.

Bleeding from the long and wide wound surfaces was inconsiderable and easily controlled by compression and close suturing. Nevertheless the author proposes in his next case to infiltrate the field of operation with adrenalin solution as is done in laminectomy in order to prevent bleeding.

In the case reported the wound healed by primary intention. In six weeks the plaster-of-Paris bandage was changed. It was then found that the hip was still elastic; the bony bridge between the crest of the ilium and the trochanter was easily palpated. The X-ray showed the head of the femur in the acetabulum and the pedunculated and freely transplanted bone flaps well joined. No bone atrophy or new formation of bone was demonstrable.

The procedure described is indicated only in cases of destructive osteitis in which an operation of considerable magnitude is warranted and no abscess is present.

VON LOBMAYER (Z).

Bull, P.: Bilateral Ankylosis of the Hip; Arthroplasty According to Murphy (Doppelseitige Ankylose der Hufte; Arthroplastik nach Murphy). *Norsk. Mag. f. Lægevidensk.*, 1921, iv, 39.

The patient was a 14-year old boy who, four years previously, was ill for five months with pneumonia followed by scarlet fever. Since then, both hips had been ankylosed in 60 degrees flexion. The

X-ray showed bony ankylosis. October 9, 1918 an operation was performed on the left hip. An arched incision was made around the trochanter, the head chiseled free from the acetabulum, and a fat flap inserted. The leg was then fixed in between 20 and 25 degrees abduction and complete extension. After eight days passive movement was begun. In two months maximum flexion was 60 degrees; extension, 10 degrees; abduction, 20 degrees; and rotation, 30 degrees. February 12, 1919 a similar operation was performed on the right side, but in this instance the abductors were cut. In spite of the same after-treatment the resulting movement was not as good, but the functional results on the whole were satisfactory.

PORT (Z).

Wheeler, W. I. D.: Reconstruction of Ankylosed Knee Joints. *Brit. J. Surg.*, 1921, ix, 242.

Opinion is divided as to the relative merits of arthroplasty and excision in the treatment of stiff and diseased joints. In certain cases the indications for one or the other are comparatively clear. For the elbow joint excision is again becoming favored. In the shoulder, both operations yield satisfactory results. In the hip joint stability is so essential that if a mobilization operation is indicated most surgeons prefer arthroplasty to excision. With regard to the knee there is almost unanimity of opinion, sound ankylosis being preferred in the great majority of advanced cases. Reconstruction of an ankylosed or diseased knee joint to restore movement has been summarily dismissed by many authorities as an operation based on unsound principles and rarely successful.

In September, 1919 the author examined a girl 11 years of age who gave a history of acute osteomyelitis of both tibiae, a prolonged illness, and frequent operations. Both knee joints were firmly ankylosed, the left in flexion and the right in extension. The X-ray showed firm bony ankylosis with destruction of the epiphysis of the femur and tibia on both sides.

An operation was performed on the left knee by the Murphy method. An incision about 4 in. long and slightly curved with its concavity backward was made on either side of the patella and the skin reflected freely. Two tongue-shaped flaps of fat and the fibrous layer of the capsule, with their bases downward were attached over the internal and external surfaces of the upper extremity of the tibia. A Jones gouge was easily driven through the new bone binding the femur and tibia, and the knee fully flexed.

The lower end of the femur and the upper end of the tibia were cleared of all irregular bone and both surfaces fashioned to leave as large an amount of bone in the lateral diameter as possible, thus diminishing the tendency to lateral instability. A mortise in the form of a substantial groove was made on the surface of the femur from front to back and a corresponding tenon cut in the tibia to limit the lateral gliding of one bone upon the other.

Care was taken to remove slightly more bone from behind in order to diminish any tendency to hyper-extension. The flaps were then placed loosely across the upper end of the tibia and fixed in position by a few points of suture. When the flexed joint was brought into the straight position the extensors were unduly lax and the patella was turned over with great ease, a manœuvre which prevents subsequent fixation to the front of the femur. There was very little pain.

After eight days the leg was immobilized on a simple posterior splint. The child was encouraged to move the joint actively as the limb lay unbandaged on the splint but great care was taken to prevent any movement in a lateral direction. Massage and passive movement were employed after the first two weeks. The patient was discharged two months after the operation on a caliper splint jointed at the knee. She was then able to walk without pain and had voluntary flexion of about 4 degrees. To obtain a good result by arthroplasty nothing is of greater importance than the prevention of pain.

Six months after the operation the patient was re-admitted to the hospital for treatment of the other knee. In this instance the after-treatment was modified and improved upon. Extension was maintained by means of a Thomas knee bed splint which was daily loosened for massage and active movement.

The patient was examined again two years after the first operation and eighteen months after the second. She was then walking freely without a splint or crutches, and but for a slight forward bend in the body her gait was almost normal.

The author states that the object of this paper is not to advocate arthroplasty of the knee joint, but to show that under favorable circumstances and when there are real indications for the operation there is a reasonable prospect of success.

S. C. WOLDENBERG, M.D.

Kleinberg, S.: The Whitman Loop Operation for Equinovalgus. *J. Am. M. Ass.*, 1921, LXXVII, 1390.

After analyzing the mechanics of acquired equinovalgus the author points out that there are two problems to be met in correcting the deformity: (1) the placing of the dorsal flexors so that in functioning they will hold the foot in normal relation to the leg, and (2) the reinforcement of these tendons by the transplantation of other tendons. He believes that the Whitman loop operation meets these requirements.

In this procedure the dorsal flexors are displaced to the inner side of the foot by looping the distal part of the tibialis anticus tendon around the dorsal flexors and implanting it into the tibia. The dorsal flexors are re-inforced by a physiological transplantation of the peroneus brevis and tertius through the sheath of the tibialis anticus, and by transplantation of the extensor proprius hallucis to the inner side of the foot.

The limb is then put up in plaster with the foot adducted and at an angle of 100 degrees with the

leg. Walking is permitted in ten days and the cast is removed in four weeks. After that the patient is required to use a flat foot brace with the shoe raised on the inner side $\frac{1}{8}$ to $\frac{1}{4}$ in.

The author stresses the importance of keeping the foot in slight varus and at a right angle after the cast is removed. For this purpose a posterior night splint is used.

He reports thirty-two operations on thirty patients between the ages of $4\frac{1}{2}$ and 28 years. The duration of paralysis was from three to twenty-six years. The results were classified as excellent in fourteen cases and as good in ten. In five cases there was improvement and in one the treatment failed.

The author believes the loop operation is indicated only in cases of paralytic equinovalgus in which the dorsal flexors, peronei, and calf muscles are strongly active. The technique is illustrated by five plates.

JOHN W. POWERS, M.D.

Gaenslen, F. J., and Schneider, C. C.: The Treatment of Tuberculosis of the Ankle in the Adult. *J. Am. M. Ass.*, 1921, LXXVII, 1168.

The authors state that in deciding upon the treatment of tuberculosis of the ankle we must take into consideration: (1) the prognosis with conservative treatment; (2) the duration of conservative treatment; (3) the length of time conservative treatment should be tried before resort is had to operative measures; and (4) the percentage of cases in which amputation is ultimately necessary.

Tuberculosis of the ankle is not infrequent. It may primarily affect either the synovia or the bone. In astragalo-tibial disease swelling is usually noticed first on the front of the ankle, on either side of, and along the extensor tendons. Fluctuation followed by effusion is noted below the malleoli. In walking there is a tendency to equino-valgus with outward rotation of the leg and foot, by which any motion of the astragalo-tibial and astragalo-scapoid joints is avoided.

The prognosis in the cases of children is fairly good if rigid and consistent conservative treatment is carried out. Statistics from different clinics show that in adults conservative treatment requires a very long time to effect a cure. The authors advise conservative treatment with fixation of the ankle for a period of six months to ascertain the character of the disease and the virulence of the infection. If there is then no improvement much time will be saved by radical operative measures.

The technique of the operation for fixation of the ankle is as follows:

A vertical incision is made from a point 2 in. above the external malleolus and behind the fibula, downward below the malleolus, and forward to the lateral border of the head of the astragalus. The peroneal tendons and the external lateral ligament of the ankle joint are divided. The capsule is divided to allow dislocation of the ankle so that the sole of the foot faces upward. The diseased synovial

membrane and the entire articulating cartilage of the tibia, fibula, and astragalus are removed. The astragalus is shaped to fit between the malleoli and the foot is replaced and fixed midway between valgus and varus in slight equinus to allow for the heel of the boot. When the astragalus is extensively involved it may be removed and a tibio-calcaneoarthrodesis performed.

If the disease is extensive and not apt to be controlled by the treatment described amputation is advised.

Six cases are reported.

In conclusion the authors state that in conservative treatment of tuberculosis of the ankle joint in adults the prognosis is poor. The duration of such treatment in cases terminating favorably is found from statistics to be four years. Six months of conservative treatment will be sufficient to indicate whether radical treatment should be carried out. When operation is performed early the patient is usually able to return to work in from one to two years.

FRANK G. MURPHY, M.D.

Hoke, M.: An Operation for Stabilizing Paralytic Feet. *J. Orthop. Surg.*, 1921, iii, 494.

The incision extends from over the head of the astragalus downward and backward, ending under the external malleolus. The head, neck, and adjacent under-surface of the astragalus are denuded of all soft tissues. With hammer and osteotome a portion of the interior surface of the body of the astragalus and the adjacent surface of the os calcis are removed. Next, the neck of the astragalus is cut through where it joins the body. The amputated neck and head are freed from the scaphoid and removed. The articular surface of the scaphoid is curetted. The cartilaginous facet on the upper surface of the os calcis, on which the foot rotates laterally on the head of the astragalus, is then removed with a chisel.

At this stage, with the head and neck of the astragalus out and the body of the astragalus freed from

the os calcis, the surgeon is "able to correct the posterior foot deformity, to set the posterior end of the os calcis in line with the center of the leg, to shift the os calcis laterally in line with the central axis of the leg, to correct lateral rotation of the os calcis, to pitch the heel up or down, and to shift the foot back, as Whitman has pointed out is so essential in his astragalectomy." After the articular surface has been destroyed and a portion of the neck has been cut off the excised piece of the astragalus is reinserted. With the foot in the corrected position, the head of the astragalus fits back snugly and is pushed well down on the os calcis. The foot is held in marked dorsal flexion while the cast is applied.

The operation is done for all paralytic feet which show much architectural deformity and great loss of muscle power as in such cases a stable skeletal foundation is necessary. Tendon transplantations and fixations done alone and the use of silk ligaments are regarded as unmechanical procedures. The Davis operation is regarded as a blind procedure, and the Whitman astragalectomy as objectionable except for calcaneus and possibly for flail feet.

The author's operation was first done in January, 1917, and since then 104 cases have been so treated. Of these, only fifty-seven have been seen at the end of periods varying from six months to three years later. In all, the foot was stable. The reason for such a stabilizing operation is that the joint between the foot and leg is one of universal motion and when the muscles which control it are paralyzed the joint is useless. The leg becomes analogous to an artificial limb with a universal joint at the ankle. It is as useless to attempt to fix an unstable ankle joint by tendon fixation as to attempt to fix a universal joint in an artificial leg by tacking straps across it.

With variations in the technique, particularly in the manner in which the head of the astragalus is put back, the operation described is adaptable to drop-foot, flat-foot, and club-foot.

WILLIAM A. CLARK, M.D.

SURGERY OF THE SPINAL COLUMN AND CORD

Bonniot, A.: Resection of the Transverse Process of the Fifth Lumbar Vertebra (La réséction de l'apophyse transverse de la 5^e vertèbre lombaire). *Lyon chirurg.*, 1921, xviii, 445.

Resection of the transverse process of the fifth lumbar vertebra for painful sacralization of this vertebra is a simple procedure according to the publications on the subject, but little is said regarding the technique employed. In Bonniot's opinion the operation is often a more or less blind one, the surgeon being doubtful concerning the identification of the osseous projection he resects.

Bonniot has made an anatomical and X-ray study of the region to determine a route by which the transverse process in question may be approached most accurately. On the basis of this study he draws the following conclusions:

1. There is no anatomical landmark by which the fifth transverse process can be located exactly. X-ray procedures alone will permit its localization.

2. The multiple insertions of the sacrolumbar mass almost always converge on the line of the tubercles of the transverse process between 2.4 and 2.8 cm. from the median line immediately within the base of the transverse process.

3. The trunk of the dorsospinal arteries is situated on this same line and the path of these arteries is entirely inside this line.

4. The last two considerations determine the choice of a route of approach to the transverse process. Immediately in front of the fifth transverse process is a triangle bounded by the lower portion of the psoas muscle below and outside, the

vertebral body inside, and the sacral wing below. Within this triangle run the nerve trunks from the fourth lumbar and the ascending lumbar vein. Resection of the spinous process exposes the organs immediately adjacent to the anterior surface of the transverse process. The finding of this landmark, which is absolutely constant and is present only in the vicinity of the fifth transverse process, assures correct resection.

The incision based on these considerations is vertical, about 10 cm. in length, and extends down along and a little inside the external border of the sacrolumbar mass as far as the iliac crest where it turns inward to follow the crest as far as the posterior inferior iliac spine. The muscle mass is incised and dissected up to its insertion on the iliac spine, and immediate access to the fifth lumbar apophysis is obtained by an osteotomy in the posterior part of the iliac spine.

This trans-osseous disinsertion appears to the author to have a triple advantage in the fact that it is more rapid and smoother than a rugine disinsertion, gives much better exposure, and is better adapted to the complete reconstruction of the muscle.

W. A. BRENNAN.

Cassirer: Traumatic Injuries of the Spinal Cord
(Zur Klinik der traumatischen Schädigungen des Rückenmarks). *Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1921, lxx, 110.

Most of the traumatic injuries of the spinal cord in pre-war times were due to indirect violence. Those due to shooting or stabbing were rare. During the war the conditions were reversed. In 184 cases seen by the author there were only ten which were not due to injury by a projectile or stabbing.

The action of a projectile is very complicated. There is a combination of direct injury of the spinal cord with destruction of the vertebral column and the consequences of the accompanying fall. The injury of the cord is dependent only slightly upon the mechanism of the injury, but a projectile which becomes lodged and a projectile which passes through are different in their effects, the former being much more dangerous than the latter.

The clinical symptoms of injury to the vertebrae diminish in importance when the cord is involved. In such cases the X-ray is of great value but a positive roentgen finding does not indicate whether the bony change is related to the lesion of the cord. In a number of cases the spinal cord was shown to be entirely uninvolved in spite of very marked changes in the spine, and severe disturbances in the spinal cord are often found when no alteration whatever is demonstrated in the vertebral column.

Clinically cases of injury of the cord may be divided into the following groups:

1. Those with a complete transverse break without a tendency to retrogressive changes.
2. Those with a partial transverse break (lesions of one side) without a tendency to retrogressive changes.

3. Those which from the beginning show severe symptoms of a total transverse break and a pronounced tendency to retrogressive changes.

4. Those which from the onset show slight spinal symptoms and a pronounced tendency to retrogressive changes.

In some cases the original symptoms of cord injury may be severe and yet disappear as quickly as they came, leaving no trace behind them. The cauda equina is injured most frequently, the dorsal and cervical cord next most frequently, and the lumbar cord least often.

The immediate results of a severe injury of the cord consist in general of a loss of all function in the regions below the point of injury. In this respect the region affected by the projectile and the site of the injury to the cord do not necessarily agree. The paralysis of the voluntary movements is complete and of the flaccid variety. The tendon reflexes are lost. However, there are a very few authenticated cases in which, with complete severance of the cord, the tendon phenomena remain. The skin reflexes, on the other hand, may be retained.

Under certain conditions the spinal cord below the place of injury shows a diffuse reflex activity. The reflexogenic zones are enlarged, but the reflex result is less typical. For example, the stroking of the sole of the foot may produce a spasm of the flexors and also emptying of the bladder and an excessive outbreak of perspiration. This phenomenon is termed "mass-reflex."

The ordinary tendon and skin reflexes of the lumbar cord in general remain dependent upon the governing centers. The spinal reflexes of the bladder and rectum are far more independent of the governing centers. In injury of the anterior horns and roots the paralysis is characterized by degenerative reaction. In the course of time this proceeds to a diffuse but not extreme atrophy.

A constant accompaniment of a complete transverse lesion is the rapid development of decubitus. Complete absence of sensibility is found in one-third of the cases. The region of anaesthesia is for the most part smaller than that of pain disturbance and disturbance of the thermal sense. Above the area of complete absence of sensibility there is often a hyperæsthetic zone. The motor disturbances correspond, according to their localization, to the spastic type, through injury of the cortical spinal path of conduction, or to the atrophic degenerative type, through injury to the anterior roots and horns.

The tendon and skin reflexes in the upper extremities are not entirely constant and their diagnostic significance is therefore not very important. The contractions are in all the limbs and usually extensor. In the lower extremities spastic phenomena are frequently in the foreground. In this case severance of the posterior roots according to the method of Foerster is beneficial.

The separate types of sensibility are differently involved. First come the disturbances of thermal

sense. These are followed by disturbances of the sense of pain. Then come disturbances of deep sensibility, and finally those of the sense of touch and pressure. Vasomotor disturbances are important, but the laws of their dependency on the nature and extent of the lesion in the spinal cord are not clearly recognized. Bladder, rectal, and sexual functions may be retained even when there is complete destruction of the cauda.

A niveau-diagnosis is dependent chiefly on the circumference of the anæsthesia. Consideration of the path of the projectile, the bone injury, and the roentgen picture are further checks on the diagnosis. The examination of the spinal fluid is of diagnostic value in the first days following the injury if blood and particles of spinal cord are found in it.

Frequently the lesion of the cord gives rise to serofibrinous meningitis. Cases of epidural and subdural hæmorrhages are very rare. The disease picture of hæmatomyelia is of no great value. Particularly difficult to diagnose are the cases in which there are combined organic sequelæ of an injury of the cord with functional and nervous phenomena. Under the influence of blunt trauma there develop in various points of the cord, in addition to the results of shock, minute histologic changes which may cause permanent loss of function.

The prognosis may usually be determined during the first weeks. If in this period there is a distinct decrease in the symptoms, the prognosis is not entirely unfavorable even in cases of severe injuries of the cord.

Injuries to the cervical cord are in a much better location than injuries to the lumbar cord. Injuries of the cauda also show a decided tendency to heal.

In cases of lodged projectiles surgery is indicated before all else. Only when the projectile has lodged in the body of the vertebra and there are no symptoms should it be left untouched. Cases of vertebral fracture with symptoms that remain stationary or become worse should be operated on if the patient's general condition is good. An operation may be indicated even when the symptoms suggest a complete transverse lesion as complete loss of function is not necessarily dependent upon total anatomical destruction of the transverse section.

It is only in the rarest cases that spinal cord injury causes organic disease of the cord. Tabes and multiple sclerosis certainly do not arise in this manner, and the traumatic origin of syringomyelia is also highly improbable. On the other hand, it is possible that chronic anterior poliomyelitis may have its origin in such injury.

MEYER (Z).

SURGERY OF THE NERVOUS SYSTEM

Coughlin, W. T.: Section of the Sensory Root of the Fifth Cranial Nerve under Local Anæsthesia. *Surg., Gynec. & Obst.*, 1921, xxxiii, 424.

In this article, which was read before the Western Surgical Association in 1920, the author gives a résumé of the history not only of root section but also of the ordinary operations that have been done for trigeminal neuralgia major—*tic douloureux*. After having used local anæsthesia for almost every operation that is done about the head, face, and neck, he concluded to try it for root section.

The patient is seated in a dental chair with a head support. The line of incision is oblique and extends from $\frac{1}{2}$ in. below the center of the zygoma upward and backward for about 3 in. The skin in this line is infiltrated with $\frac{1}{2}$ per cent procaine with 4 drops of adrenalin to each ounce. The loose tissue and the pericranium are also infiltrated. On either side of the lower end of this line and about $\frac{3}{4}$ in. from it similar infiltration is made to the height of 2 in. All the tissues to the bone are infiltrated. The incision is made, the vessels are caught, the temporal fascia is incised in the same line, and the muscle is exposed.

The temporal fascia is next freed from its attachment to the zygoma, the muscle fibers are separated, and retraction is made to expose the bone. The periosteum is scraped off and an opening drilled in the skull with a burr a short distance above the level of the zygoma. The opening is enlarged with a rongeur to a little less than the size of a half dollar

and made somewhat horseshoe shaped with its convexity upward. It extends down to the base but not far into it.

The dura is pushed away and the middle meningeal artery tied and cut. Before the vessel is tied procaine is injected around it. Pledgets of cotton are used in separating the dura. These are soaked in procaine and adrenalin solution to lessen the bleeding and pain. When the third and second divisions of the trigeminal nerve are reached they are injected with procaine. The notch at the apex of the petrous bone against which the ganglion lies is exposed. The dura is incised from a point midway between the second and third divisions of the nerve upward and backward toward this notch and elevated from the surface of the ganglion until the root is seen entering the fossa of Meckel. Here the root is either cut or grasped and avulsed. If there is tenderness or pain during the exposure and isolation a pledget soaked in 4 per cent cocaine is laid upon the root for a few moments.

Roeper, E.: Conclusions from 1,200 War Injuries of the Peripheral Nervous System (Schlussfolgerungen aus 1,200 Kriegsverletzungen des peripheren Nervensystems). *Deutsche Ztschr. f. Nervenhe.*, 1921, lxxviii, 409.

The 1,200 cases observed by the author included 849 injuries of the arm and shoulder and 459 injuries of the pelvis and lower extremities. Severe injuries are not restricted in their effects to the region of the

wound, but influence profoundly the entire central nervous system. On the other hand, a true reflex epilepsy has never been observed. Spontaneous pain appears chiefly following injury of the median and tibial nerves, but seldom following a lesion of the radial nerve and almost never injuries of other nerve regions.

Injury of the median and tibial nerves presents a variety of peculiarities. An injury of the median nerve alone may cause disturbances of a trophic nature in all five fingers of the hand. An aneurism of the axillary artery produces acute spontaneous pain in the region of the median nerve but the symptoms of loss of motor impulse are slight.

In injury of the tibial or the median nerve, symptoms of neuritis are prominent. The palm of the hand and plantar surface of the foot are especially differentiated in their sensory perceptions. Hysterical overlapping is often found in injuries of the tibial and median nerves. There is often a striking lack of correspondence between the object-

ive findings at the point of injury and the loss of function. Operative exposure of the site of injury offers the best prognosis if done early, but the average results achieved by operation are not particularly good.

The author cites 192 results, of which 98 were obtained by suture of the nerve and 94 by neurolysis. Only five cases of nerve suture resulted in complete success. In fourteen cases there was alleviation. Suture of the radial nerve offers the greatest prospect of complete restoration of function. The results of neurolysis are better than those of suture. Of ninety-two cases operated on, good effects could be determined in forty-three.

In conservative treatment, swimming gives particularly good results. In conditions of irritation good results have been obtained by injections of fibrolysin into the cicatricial region. Orthopedic apparatus are of great value for the lower extremities, but of less value for the upper extremities.

MEYER (Z).

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Curchod, H.: Hutinel's Disease and Its Surgical Treatment (La maladie d'Hutinel et son traitement chirurgical). *Rev. méd. de la Suisse Rom.*, 1921, xli, 648.

Hutinel's disease, described in 1893 as "juvenile cardio-tuberculous cirrhosis", corresponds to the callous mediastino-pericarditis of Kussmaul. The author has observed three cases:

The first was of very slow evolution. The condition began in infancy with pleurisy. At the age of 20 the liver was enlarged, and it was only at the age of 46 that asystole became evident.

In the second case the condition began with a fever when the patient was 13 years of age. In three months hypertrophy of the liver and cyanosis developed. The disease then remained stationary for three years. The symptoms and fever then increased.

In the third case the condition began at the age of 3 years and resulted in death in the seventh year after nine months of asystole with general anasarca.

Curchod emphasizes the disproportion between the symptoms of cardiac lesions, which are generally very slight, and the gravity of the peripheral asystole. He states that it is not necessary to find evident signs of pericarditis. Instead, we must seek for the fixed position of the cardiac dullness, especially at the apex, which does not change with a change in the position of the body. X-ray examination is of value as it often shows the characteristic picture of pericarditis with associated pleuropulmonary lesions and obscurity of the clear cardiovertebral space.

In each of his three cases Curchod noted a characteristic distribution of oedema. In the early stages oedema is present in the face and often the hands.

It does not last long but is never absent and precedes oedema of the lower extremities which appears only when asystole is manifest. This oedema, which is characteristic of Hutinel's disease, is due to compression of the superior vena cava by the adhesive mediastinitis associated with the tuberculous pericarditis.

Surgical treatment is indicated in Hutinel's disease to give space to the heart compressed in its fibrous sheath. The recognized procedure is Brauer's precordial thoracotomy first done in 1902. This operation, which is easy and without special risk, has been done in France several times. It was performed in the first and second of the author's cases. In the first case the result was satisfactory, but in the second an acute exudative polyserositis caused death. In the third case operation was not possible.

In reviewing the literature the author finds that the only cases in which the result has been brilliant were cases of pericarditis without valvular lesions. In those with valvular lesions the outcome has not been favorable or death rapidly followed operation. It seems therefore that thoracotomy should be reserved for cases of adhesive tuberculous pericarditis or those in which valvular lesions or symptoms of cardiac cirrhosis of the liver may be ruled out. Fever and tuberculosis in evolution are absolute contra-indications.

W. A. BRENNAN.

Lemon, W. S., and Doyle, J. B.: Clinical Observations of Hodgkin's Disease, with Special Reference to Mediastinal Involvement. *Am. J. M. Sc.*, 1921, clxii, 516.

The authors review twenty-six cases of Hodgkin's disease with mediastinal involvement which were observed at the Mayo Clinic. Twenty-three of these

cases were definitely proved by the microscope. The age incidence in this series was 20 to 64, which is contrary to Reed's observation that children are most frequently attacked. No relationship of the condition to tuberculosis could be established, nor could acute throat infections be said to have had an etiological bearing.

Few of the patients made complaints in any way suggesting mediastinal lesions. Dilated veins over the chest were present in three cases in association with cyanosis and swelling of the face and neck. Pruritis was complained of in four cases. Fluid was found in one or both thoracic cavities in eight cases, an incidence of 30.7 per cent.

Glands were palpable in the cervical region in 100 per cent of the cases, in the supraclavicular area in 58 per cent, in the axillary region in 50 per cent, in the abdominal region in 19 per cent, and in the inguinal region in 42 per cent. Splenomegaly occurred in 23 per cent, and enlargement of the liver in 11 per cent.

Blood counts made in twenty-three cases revealed no definite variations from the normal.

X-ray examination is most useful and important in demonstrating mediastinal involvement before it can be shown clinically. A positive opinion was given in eight cases. Hodgkin's disease is suspected when the roentgenogram reveals a bilateral feathery shadow passing out from each hilus.

Tuberculosis was present in only one case. This patient had extensive involvement and suffered from the pressure effects of a tremendous tumor which had entirely disappeared under treatment. Acute miliary tuberculosis caused death.

Besides the usual treatment, which is comparable to that employed in tuberculosis, many patients have been treated with radium. The glands respond most satisfactorily. In cases of mediastinal complications roentgen therapy gives the best results. It should be begun before the deeper glands can be palpated and should be kept up for a long time in association with treatment with radium which is more useful over the superficial glands.

Orr-Ewing, H. J.: A Case of Multiple Serositis (Pick's Disease) of Unusual Distribution. *Bristol M.-Chir. J.*, 1921, xxxviii, 90.

Cases of multiple serositis are not common. Usually they are obscure in origin and their diagnosis is difficult. The case reported was characterized by considerable abdominal distention, enlargement of the spleen, apparently a hydrothorax, anæmia, and periods of pyrexia. Malignant tertian ring and crescents were present in the blood films.

The author discusses the differential diagnosis. The condition may be confused with tuberculosis, syphilis, multilobular cirrhosis of the liver, Banti's disease, malignant disease of the peritoneum, and Hodgkin's disease.

Treatment is unavailing.

FREDERICK CHRISTOPHER, M.D.

Kraus, A.: A Contribution to the Study of Cystic Lymphangioma (Contributo allo studio del linfangioma cistico). *Arch. ital. di chir.*, 1921, iv, 63.

Kraus' case was that of a child aged 2 years which at birth had a tumefaction in the antero-external part of the right side of the chest. This growth had remained almost stationary except during the past two months when it had rapidly increased in size until its circumference was 51 cm. Following its surgical removal it was found to weigh 1,050 kgm. The child made a good recovery. Macroscopic and microscopic examination showed that the tumor was a cystic lymphangioma.

Kraus reviews the history of the condition and from this and the study of his own case draws these conclusions:

1. Cystic lymphangioma is congenital. It should be considered a true neoplasm.

2. The tumor is formed by single groups of lymphatic vessels newly formed in young connective tissue which are separated by adult connective tissue bands to form lobes.

3. The lymphatics of each single group coalesce to form cysts. The cysts of a single group come into direct contact with cysts of other groups and become merged with them.

4. When the pericystic connective tissue or the vascular walls of two merged lymph vessels do not quite disappear, lacunæ and spaces are formed which appear within the lumina of the cysts. The increase in the lumina of the lymph vessels and of the consecutive cysts may result from retraction of the connective tissue.

5. The walls of the cyst may show strata of substances organized from the cyst contents. In the solid, newly formed tissue the phase of new formation of lymph vessels is probably reproduced and thus the cystic formation is rapidly renewed.

6. The stratification on the walls of the cyst of solidifying substances from the liquid contents may completely obliterate the cyst or change its lumen.

7. Tuberculosis does not appear to be an etiological factor.

W. A. BRENNAN.

BLOOD

Harlow, F. W.: Death from Spontaneous Hæmorrhages. *J. Roy. Army Med. Corps.*, Lond., 1921 xxxvii, 312.

The author's patient had first a slight bleeding from the gums and palate. Later there was hæmatemesis, profuse hæmaturia, and severe rectal hæmorrhage. The final picture was that of an internal hæmorrhage. Death followed a period of severe shock.

Harlow discusses the diseases in which death may occur from spontaneous hæmorrhage and concludes that the case he reports was one of purpura hæmorrhagica unaccompanied by cutaneous extravasation.

FREDERICK CHRISTOPHER, M.D.

Burk, S. B., and Fischer, L.: *Transfusion in Infants with Malnutrition. Med. Rec., 1921, c, 751.*

Burk and Fischer state that after careful search they were unable to find the use of transfusion in malnutrition recorded in any recent textbooks on the diseases of children. Its indications are as follows:

1. Progressive loss of weight and improper metabolism of food resulting in atrophy with a senile expression.
2. Cold extremities, feeble heart sounds, thready pulse, and symptoms pointing toward general exhaustion.
3. Catarrhal or fermentative colitis with dehydration of the blood, feeble pulse, and signs of imminent collapse.
4. Acute infectious diseases such as typhoid, prolonged scarlet fever, diphtheria, influenza, or a post-pneumonic condition wherein a secondary anemia follows.
5. General weakness in premature infants following a prenatal disease such as congenital syphilis or weakness due to improper nourishment given by a tuberculous mother before the latter comes to the clinician.
6. Weakness due to tropical diseases.
7. The presence of avitaminosis in addition to the use of antiscorbutics.

Maternal milk is the best food known but many breast-fed infants are undernourished. This deficiency can be supplied by giving complementary feedings of cream and carbohydrate, chiefly maltose. If the infant continues to lose weight and its extremities are cold, we must direct our attention to the circulatory system. In the cases of marasmic infants the authors have tried hypodermoclysis. The injection of 4 oz. of warm normal saline solution every twenty-four hours is often beneficial. In many instances warm saline colonic instillations given at a temperature of 105 to 108 degrees F. will add fluid to the circulation. Hypodermic medication with adrenalin or strychnin often fails to stimulate the heart action. In this class of cases transfusion may be the only means of saving life.

After a detailed review of the method and the avenues of approach to the circulation in children, the following observations are made:

The preferable areas for transfusion are: (1) the median cephalic vein; (2) the median basilic vein; (3) the external jugular vein; and (4) the superior longitudinal sinus.

It is frequently very difficult to enter the veins at the elbow or the neck and much valuable time may be lost in futile attempts. Exposure by cutting down on the veins subjects a weakened patient to the additional dangers of shock and infection.

In the use of the superior longitudinal sinus all objectional factors are eliminated. Up to the age of 2 to 2½ years the anterior fontanelle lends itself admirably to this operation. The following instruments and supplies are necessary:

One 30-ccm. glass syringe (Record or Luer); several 18-gage 4-cm. needles; one ordinary glass jar or drinking glass; one glass stirring rod; one bandage or rubber tourniquet; one tube of sterile 25 per cent sodium citrate solution; tincture of iodine; 95 per cent alcohol; and sterile gauze.

Relative to the selection of the donor the following statement is made: "It is well known that the use of indiscriminately selected donors may nullify the value of the transfusion or even be disastrous to the recipient. It is therefore necessary to select a vigorous, healthy individual with an approximately normal red blood cell count and hæmoglobin content, whose history is negative for lues and whose Wassermann blood test is negative. No one with an elevation of temperature or convalescing from an infectious disease should be used. Moss recommends as donors cardiacs who have a normal blood count and in whom venesection may be indicated. When the foregoing qualifications have been fulfilled the danger of incompatibility due to hæmolysis and agglutination must be eliminated."

The hæmolysis and agglutination tests are made according to the Vincent modification of the Moss technique:

Two prepared sera, a glass slide, and a number of toothpicks are necessary for the test. One or two drops of Serum 2 are placed on the left half of the slide, and an equal amount of Serum 3 on the right half of the slide. The ear or finger of the person tested is punctured and a small drop of blood transferred with a toothpick to each of the sera in turn and stirred into it. The blood should be transferred before coagulation has begun, and care should be taken to avoid mixing the two sera. Agglutination of the corpuscles is accelerated if the serum is agitated by tipping the slide from side to side. If the reaction is negative, the corpuscles make a uniform suspension in the serum. If the reaction is positive, the masses of agglutinated corpuscles usually appear in less than a minute and are discernible by the naked eye. Rouleaux formation can be eliminated by stirring the mixture; agglutination is not broken up in this manner. The reading should be confirmed by microscopic examination. In order to eliminate contamination in handling the blood and sera a different toothpick is used in each step of the technique.

After the proper donor has been obtained, the front of the elbow region is painted with 3½ per cent tincture of iodine and a tourniquet applied just below the deltoid region lightly enough to cause the veins to stand out prominently but not so as to obliterate the arterial pulse. The median cephalic or median basilic vein (whichever is more readily accessible) is then punctured, and a predetermined amount of sodium citrate solution is added to the withdrawn blood to make a 0.3 per cent solution, the assistant constantly stirring the mixture slowly.

The infant is wrapped in a sheet, with the head exposed, and placed flat on its back, the assistant steadying the head with the face upward near the

edge of the table. The anterior fontanelle is painted with a $3\frac{1}{2}$ per cent tincture of iodine and the posterior angle of the fontanelle located with the index finger of the free hand.

The citrated blood is drawn into the syringe with the needle attached and the needle then slowly introduced into the posterior angle for a distance of 1 to 2 cm. parallel to the direction of the inner table of the skull. On entering the sinus one gets the definite sensation of entering the lumen of a vessel. This is similar to the experience in piercing the dura in doing a lumbar puncture. The operator steadies the needle with one hand and injects the fluid slowly. If the needle is in the sinus there is no resistance to the injection. If resistance is met, the needle is withdrawn and the procedure repeated. When in doubt, it is always well to withdraw some blood before beginning the injection. The injection of an ounce of fluid should take from one and one-half to two and one-half minutes. Pressure with sterile gauze over the site of puncture for a few minutes is all that is necessary in the after-care of the scalp.

Fourteen transfusions were performed on ten infants whose ages ranged from nine days to six months. Seven were under two months of age. The amount of blood injected averaged about 1 oz. and the time of injection averaged about ninety seconds. Four injections were followed by severe reactions; seven by moderately severe reactions; and three by slight reactions. The severe reactions consisted of a short period of dyspnoea which lasted about twenty-five to forty seconds. A child who often cried lustily when the procedure was begun became suddenly quiet. Cyanosis of the face and pallor about the mouth appeared about this time, together with lateral and vertical nystagmus. The radial pulse remained unchanged. Soon thereafter the child again became noisy and restless. The period of quietude lasted only a few minutes.

A 0.3 per cent citrated solution was used in the transfusions without any harmful effects. This amount of sodium citrate facilitated the passage of the mixture through the small needle with greater ease than the 0.2 and 0.25 per cent solutions.

In four cases there was marked improvement following the transfusion, in six there was a slight improvement, and in two there was no improvement.

Feeding should be delayed for at least one hour after the transfusion. If the child is fed sooner, vomiting occurs.

The conclusions drawn are as follows:

1. Transfusion of citrated blood is a simple operation and a recognized valuable therapeutic agent. Its use should become an everyday procedure in hospital and private practice.

2. It is oftentimes a life-saving procedure in the treatment of diseases of the hæmatopoietic system. The so-called hæmorrhagic diseases of children are greatly benefited by this procedure.

3. It is valuable in the treatment of malnutrition and the cachexia following acute infections.

4. It improves the general condition of patients with gastro-intestinal disturbances who do not improve with formula feedings or the use of mother's milk. This is particularly noticeable when marked dehydration is present following failure in the use of hypodermoclysis, rectal instillation, and venous infusions.

5. It improves the prognosis in the cases of premature infants.

6. It is best performed in infants through the superior longitudinal sinus because of the large caliber and superficial location of this sinus.

The article is illustrated by seven figures, including three photographs, and supplemented by a tabulated summary and seventy-eight references to the literature.

BLOOD AND LYMPH VESSELS

Klein, E.: Embolism and Thrombosis of the Superior Mesenteric Artery. *Surg., Gynec. & Obst.*, 1921, XXXIII, 385.

In the author's opinion it is probable that many cases of mesenteric infarction remain unrecognized. After Watson at the Boston City Hospital became interested in this condition he found eight cases in one year although previous to that time only six had been recorded in that hospital in a period of nine years.

An intestinal infarct may be due to arterial or venous obstruction. The frequency of occlusion of each of these channels is about equal. In the arteries the closure is effected by an embolus or a thrombus. In the veins nearly all mesenteric infarctions are due to thrombosis and are generally associated with either acute appendicitis or an acute inflammatory lesion of the female pelvic organs.

The experimental work which has been done on this subject is of great interest. Ligation of the superior mesenteric artery is followed by tetanic contractions of the small intestine which in turn are sometimes followed by hæmorrhagic infarction. The initial spasm of the intestinal wall seems to prevent the functioning of the collateral circulation. Ligation of a single small branch of the mesenteric artery is uniformly without effect. Ligation of the superior mesenteric vein leads constantly to hæmorrhagic infarction. Injection of paraffin into the main trunk of the superior mesenteric artery constantly produces infarction.

Another group of experiments consisted of severing the mesentery of the intestine for varying distances from its intestinal attachment. Niederstein found that such severance for a distance of 3 cm. in dogs caused a superficial necrosis of the mucosa while severance for 5 cm. caused necrosis of the mucosa as well as hæmorrhages into the other coats or a circumscribed ulcer of the mucous membrane. None of the animals died unless more than 5 cm. was cut away, in which case a hæmorrhagic infarct developed.

These experiments test the adequacy of the collateral circulation in the submucosa of the intestine. In the author's opinion gradual closure of the superior mesenteric artery by a thrombus may not be followed by any pathological lesion because the mechanism for the establishment of the collateral circulation has had time to adjust itself.

Klein discusses the symptoms and gives a number of interesting illustrative cases. With regard to the treatment he states that there is but one, viz., excision of the infarcted intestine and re-establishment of its continuity. Twenty-four successful resections have now been reported. A favorable outcome without operation does not necessarily indicate that the diagnosis of embolism or thrombosis of the superior mesenteric artery was erroneous.

FREDERICK CHRISTOPHER, M.D.

Leriche, R.: Some Researches on the Peri-Arterial Sympathetics. *Ann. Surg.*, 1921, lxxiv, 385.

The sympathetic nervous plexus included in the external layer of blood vessels seem to possess a real autonomy. The study of the phenomena which follow the excitation of averaged-sized arteries reveals the existence of a very characteristic physiological reaction which under normal circumstances never fails.

When the sheath of an artery is removed the vessel contracts, its pulsation stops at once, and its size diminishes just at the moment its external layer is pinched. This contraction is the primary element of the characteristic physiological reaction against excitation. In the subsequent first few hours (varying from three to fifteen) pulsation is imperceptible or very feeble; the limb operated upon is colder than the other, there being a difference in temperature of 3 or 4 degrees C. After this period there appear the following secondary signs which form the next element of the characteristic reaction:

1. An elevation of the local temperature reaching 2 and even 3 degrees C., the central temperature not being changed. The patient has a subjective sensation of heat.

2. An elevation of the arterial pressure, which may reach 4 cm. of mercury according to the normal side.

3. An increasing amplitude of oscillations, shown by the sphygmomanometer. The vasodilator reaction is transitory. After peri-arterial sympathectomy it becomes attenuated from the fifth to the sixth day and disappears entirely after three or four weeks.

Pathologically, the excitation may be provoked as well on visceral arteries as on the arteries of the limbs, and by direct traumatic, indirect infectious, or toxic causes. We know absolutely nothing of these reactions at the level of the viscera. In a case of diffuse oedematous thyroid hypertrophy a unilateral high perithyroidal sympathectomy caused an extreme diminution in size of the corresponding lobe in the next few days. We are beginning to dis-

tinguish the types of phenomena resulting from injury of the peri-arterial sympathetic plexus, but their analysis is not easy:

TYPE 1. The two characteristic examples are "stupeur des artères" and Raynaud's disease. The former is an active secondary spasm due to sudden excitation of the external arterial layer. Raynaud's symptoms are typical of vasomotor sympathetic disease.

TYPE 2. In many circumstances the initial cause is less known and the physiological reaction is disturbed either by contracture or abnormally persisting dilatation, which may explain Weir Mitchell's causalgia and certain painful stumps. In all cases it produces considerable biological disturbance in the subjacent tissues, creating thus various associations of motor, sensory, vasomotor, glandular, and trophic symptoms, and even signs of local necrosis.

Peri-arterial sympathectomy is suggested as the logical treatment of these vasomotor or trophic troubles in an attempt to modify the peripheral circulation. The author has performed this operation sixty-four times: in eleven cases of causalgia; two cases of painful stumps; nineteen cases of post-traumatic contractures; four cases of post-traumatic oedema; one case of trophoedema; four cases of ischæmic sequelæ; one case of sloughing of a stump; ten cases of sloughing after nerve section; one case of sloughing after medullary injury; one case of varicose eczema; one case of trophic trouble after frost bite; one case of spasmodic paralysis; three cases of an attempt to modify the tension of the cerebrospinal fluid; two cases of Jacksonian epilepsy; one case of goiter; one case of intermittent claudication; and one case of erythromelalgia.

He has obtained remarkably successful results and has had also complete failures. Operation failed in the case of intermittent claudication, in the one case of trophic trouble after frost bite, in one case of spasmodic paralysis, and in certain cases of painful syndromes such as erythromelalgia.

J. D. ELLIS, M.D.

GENERAL BACTERIAL INFECTIONS

Frank, M.: The Pathologic Anatomy of Infection with *Streptococcus Mucosus* (Zur pathologischen Anatomie der Infektion mit *Streptococcus mucosus*). *Frankfurt. Ztschr. f. Path.*, 1921, xxi, 636

In the case of a 65-year-old man who died of lobar pneumonia complicated by suppurative pleurisy and pericarditis the cause of the disease was found to be a streptococcus which grew rapidly with profuse mucus formation upon ascitic agar but very slightly in bouillon and gelatin, did not cause hæmolysis, acidified litmus milk profusely, coagulated milk after forty-eight hours, and was highly pathogenic for mice. This organism resembled the streptococcus mucosus of Schottmueller, from which it varied only in that it produced an ochre-yellow growth upon blood plates.

At autopsy, numerous embolic hæmorrhages were found in the stomach, bowels, kidneys, and skin. These changes were due to venous thrombosis causing œdema and hæmorrhagic infiltration of the tissues. The thrombotic occlusions occurred only in the veins and the capillaries.

Injury to the heart function by bacterial toxins, the consequent slowing of the blood current, eddies in the blood current due to clumps of bacteria, and finally toxic injury to the blood elements and vessel wall must be considered as causative factors. The streptococcus mucosus must be regarded as having a special affinity for the walls of blood vessels. Therefore it may be assumed that the local accumulation of toxins played a definite rôle in the formation of the thrombosis. EMMERICH (Z).

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Homén, E. A.: *Experimental and Pathologic Contributions Regarding Infectious Toxic Meningeal Changes* (Experimentelle und pathologische Beiträge zur Kenntnis der infektiös-toxischen meningealen Veränderungen). *Arch. a. d. path. Inst. d. Univ. Helsingfors*, 1921, n.s. ii, 225.

Homén's study of the different reactions of the cerebral meninges to pathogenic bacteria was based partly on experiments and partly on post-mortem examination of the anatomically recognizable meningeal changes in clinical cases. The experiments were carried out on dogs and rabbits; subdural injections of virulent streptococci or staphylococci were given, the dose being 0.25 to 0.95 c.cm. for dogs and 0.01 to 0.35 c.cm. for rabbits. The changes began with hyperæmia which was followed by fibrino-purulent inflammation and even abscess formation. Microscopically the exudative stages were more prominent than the proliferative.

In the clinical cases in which the existing agent was the streptococcus, pronounced leucocytic infiltration was found even when the condition had been present for only a few days. From the first and second weeks the lymphocytes began to appear and progressive changes could be observed. Streptococci also were demonstrated microscopically in the meninges. Meningitis due to the pneumococcus is characterized by its fibrin formation. Pneumococci, a small quantity of fibrin, and infiltration cells are found occasionally also in patients suffering from pneumonia without clinically recognizable meningitis. On the other hand, meningitis caused by the streptococcus mucosus is similar to purulent streptococcic meningeal inflammation, while in section and colony the micro-organisms may simulate the pneumococcus of Fraenkel.

In cases of meningococcus meningitis lymphoid cells and progressive changes in fixed cells were seen in the exudate early in addition to the leucocytes. Fibrin was demonstrable in small amounts or not at all. In meningeal infection due to bacteria closely related to the influenza bacillus a tendency of the

fixed cells to proliferate was noted. Unlike all these micro-organisms, the staphylococci were shown to have but moderate avidity for the meninges.

In early luetic meningitis the infiltration consisted only of lymphoid cells, plasma cells, and proliferating fixed cells. In typhoid patients meningeal changes of the same slight degree as those noted in pneumonia patients were determined without clinically demonstrable meningitis.

Symbiosis of aerobic bacteria in the meningeal region results in a widely varying, sometimes relatively intense combined action. Colon bacilli play no local rôle worth mentioning. In symbiosis with an anaerobic streptococcus, bacilli similar to the influenza bacillus caused a meningitis characterized by extensive alteration of the cerebral substance immediately beneath; but this was not true of the associated anaerobes. In eclampsia are found meningeal changes similar to those in typhoid which are regarded as manifestations of toxæmia.

On the basis of his research, the author states that it is not possible histologically to draw a line between inflammatory and non-inflammatory changes in the meninges. The marked difference in the changes which one and the same bacterium call forth is another remarkable point. Homén classifies the bacteria into three groups according to their affinity for the cerebral meninges: (1) those without specific affinity, such as the typhoid bacilli, staphylococci, and colon bacilli; (2) those that may remain harmless, but under certain circumstances are able to produce severe meningitis, such as the streptococcus pyogenes, streptococcus mucosus, and diplococcus pneumoniae; and (3) those which have a pronounced affinity for the brain and its membranes, such as the meningococci and the bacteria resembling those causing influenza. GRUBER (Z).

Bayley-De Castro, A.: *Iodine Injections for Septic Conditions.* *Indian M. Gaz.*, 1921, lvi, 375.

Since November, 1920, the author has treated cases of the extensive phagadenic ulcers which occur not uncommonly in the Andaman Isles during the Monsoon weather, a case of chronic gonorrhœal salpingitis, and an ischiorectal abscess by means of intravenous injections of iodine and simple puncture. The ulcers were much more rapidly improved when intravenous injections of iodine solution were used than when they were treated locally with salol.

Starting with 5 minims of tincture of iodine in 1 c.cm. of normal salt solution, the dose is gradually increased to 20 minims of tincture of iodine in 10 c.cm. of normal salt solution. In ordinary cases the injections are given every other day; in severe cases, every day. Porter states that a dose equivalent to 4 gr. of iodine may be given. In the future the author expects to begin with 20 minims of tincture of iodine and increase the dose to 80 minims which would be equivalent to $\frac{1}{2}$ to 2 gr. of iodine respectively.

Within thirty-six to forty-eight hours following iodine treatment an unhealthy looking surface

freshens up, sloughs are cast off, profuse discharges of pus cease, healthy granulations appear, pain ceases, and the temperature falls to normal. A leucocytosis of 15,000 to 20,000 or more is produced.

There has been a deleterious reaction in only two cases. One patient developed severe pain in the right knee and a temperature of 103 degrees F. six hours after treatment. After twenty-four hours the joint was swollen and contained fluid but in a few days this condition subsided. In another case, in which there was probably idiosyncrasy for iodine, flushing of the face, rapid respiration, restlessness, and an intense burning sensation in the neck developed during the administration of the single injection that was given. WALTER C. BURKET, M.D.

Wyeth, G. A.: Surgical Endothermy in Malignancy and Precancerous Conditions. *N. York M. J.*, 1921, cxiv, 379.

Endothermy consists in the production of heat by the resistance of body tissue to high-frequency electric currents. The currents are varied in their voltage and amperage according to the particular condition treated. High-frequency currents are those which reverse their direction many thousands of times per second and therefore do not heat the conductors through which they pass and consequently do not raise the internal temperature of the body.

Surgical endothermy comprises dessication and coagulation. Dessication is used in the destruction of malignancy of the vocal cords, papillomata, warts, moles, naevi, leucoplakia, vernal catarrh, and milder skin epitheliomata. This is produced by a monopolar current of high voltage and low amperage. Coagulation is accomplished by a bipolar current of low voltage and high amperage which is more intense in its action. This is applicable to lesions of the lips, alveolus, tongue, floor of the mouth, palate, and buccal surfaces and to widespread skin involvement.

Endothermy is particularly applicable to accessible malignancy and precancerous conditions. The author believes that it not only alleviates pain but renders operable many inoperable cases and that, in conjunction with radium and deep X-ray treatment, it is a trustworthy aid in the treatment of malignancy.

LOYAL E. DAVIS, M.D.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Bolton, C.: Absorption from the Peritoneal Cavity. *J. Path. & Bacteriol.*, 1921, xxiv, 429.

For a considerable time the author was engaged in a study of the pathology of ascites produced in cats by narrowing the inferior vena cava in the chest. The results have already been published. This article deals only with the mechanical and physical factors concerned in the process of absorption and the paths by which it is accomplished.

Substances are absorbed from the peritoneal cavity by: (1) the subperitoneal capillary blood

vessels, and (2) the lymphatic vessels. In regard to the subperitoneal capillary blood vessels it was found experimentally that salt solution colored with a diffusible dye was directly absorbed into the blood from the peritoneal cavity, the urine being colored within five minutes and the lymph in about half an hour, and that the residue of the peritoneal fluid contained protein. It was therefore concluded that the process at work was an interchange between this fluid and the blood, each taking from the other the constituent which it did not possess. Osmosis and diffusion will thus account for the absorption of saline solutions by the blood up to the point at which there is equalization of the amounts of the various salts on each side of the membrane. The principle of direct absorption by the blood vessels by osmosis and diffusion is thus established; all parts of the peritoneum take part in this process.

With regard to the lymphatic vessels it is well known that the peritoneal cavity is not, strictly speaking, a lymph space as it has been shown that an increase in the lymph pressure will produce a corresponding increase in the flow of lymph from the lymphatics draining it. The results of various observers who have studied this subject are by no means similar. The author's own experiments dealt with the absorption of fluids and the absorption of particles. His conclusions are as follows:

1. The peritoneal cavity is drained principally by the diaphragmatic lymphatics into the mediastinal lymphatics passing through the sternal and anterior mediastinal lymphatic glands to the right lymphatic duct, and through anastomoses in the chest to the thoracic duct.

2. It is drained also by the diaphragmatic lymphatics into the cisterna chyli, but this path is quite subsidiary.

3. It is probably drained also to a small extent and very slowly into the cisterna chyli by the retroperitoneal lymphatics.

4. Particles easily pass between the endothelial cells with the lymph, the limit of size of such particles being approximately that of the red blood corpuscles of the animal used. Probably only the finest particles pass directly into the cisterna chyli and then very slowly.

5. The drainage is accomplished by a purely mechanical process, the force being supplied by the respiratory movements.

6. Colloidal dyes, which are indiffusible outside the body, pass through the peritoneum and capillary wall by diffusion directly into the blood, but more slowly than crystalloids. If colloids of a larger molecular weight are able to pass through, they must do so very slowly and in small quantity, but it is probable that molecules of the complexity of those of albumins are unable to do so.

7. Poisonous or other substances, formed by bacteria or otherwise, which are indiffusible through an artificial membrane may be directly absorbed into the blood from the peritoneum provided they are not of great molecular complexity; otherwise

they will be slowly absorbed by the lymphatics in accordance with their position in the peritoneum.

GEORGE E. BEILBY, M.D.

Wolf, E. P.: Experimental Studies on Inflammation. 1. The Influence of Chemicals upon the Chemotaxis of Leucocytes in Vitro. *J. Exper. M.*, 1921, xxxiv, 375.

In the author's work Wright's method slightly modified was employed. Equal volumes of blood were disposed over equal areas of surface which came into contact with equal concentrations of the desired reagent. This new method has been found very satisfactory for the determination of chemotaxis *in vitro*. It is definitely quantitative and all steps may be controlled so that factors of error may be practically eliminated. It permits the study of the chemotactic powers of substances heretofore never investigated. Among these are cantharidin, histamine, mustard gas, parazol, and tyramine. The results obtained by this procedure with substances frequently studied agree in practically all particulars with those obtained by other workers with different methods. It may be employed also to determine the action of unknown drugs in producing the migration of leucocytes at the site of injection.

The blood of different species of animals may react differently toward different drugs; thus, rabbit blood shows much less positive chemotaxis for cantharidin than human or dog blood. On the other hand, it was much more positively chemotactic for papayotin than human or dog blood. With histamine, human and dog blood showed more cells migrating into the agar than rabbit blood. The reason for this difference in different animals is not apparent.

The conclusions drawn from the author's experiments are as follows:

1. Wright's method for the study of chemotaxis of leucocytes *in vitro*, slightly modified, is most satisfactory in the estimation of the degree of chemotaxis of various substances.

2. The calcium ion is the only inorganic ion positively chemotactic under the conditions of these experiments. It is markedly chemotactic in all concentrations and in all combinations except the citrate. Here the negative chemotaxis of the citrate ion neutralizes the positive chemotaxis of the calcium ion, and neutrality of chemotactic effect results.

3. The sodium and magnesium ions themselves are neutral. Magnesium and sodium salts are dependent upon the negative ion with which the magnesium or sodium is combined for such positive or negative chemotaxis as is exhibited.

4. All potassium salts are negatively chemotactic.

5. Many substances act synergistically as regards chemotaxis; that is, when strontium and magnesium salts are mixed there is a marked increase in chemotaxis. Sodium phosphate acts synergistically with calcium chloride.

6. When Wright's method is used the mercury salts fix the leucocytes so that their influence on chemotaxis cannot be determined.

7. Morphine and morphine salts are positively chemotactic; this is contrary to the results obtained by others with different methods.

8. Substances which produce a very acute inflammation, such as cantharidin, histamine, and turpentine, are found by Wright's method to be positively chemotactic, but substances which produce a marked necrotizing effect, such as mustard gas, are found to be negatively chemotactic or neutral, though physiologically they would appear to be positively chemotactic.

9. All amino acids and amines are positively chemotactic to a certain extent, with the possible exception of tyramine which causes a peculiar clumping of the cells so that it is impossible to count the number adherent.

10. The time that the blood of animals is examined after they have eaten makes a marked difference in the number of cells adhering, for within thirty minutes after food is taken very many more cells will adhere to the agar than at a later time.

11. The blood of different species of animals reacts differently toward different reagents. The chemical composition of these agents seems to have nothing to do with this difference.

12. By frozen serial sections it has been found that the depth of penetration of the leucocytes into the agar is proportional to the positive chemotaxis produced by the substance combined with the agar, as demonstrated by the number of leucocytes adherent to the walls of the test chambers.

GEORGE E. BEILBY, M.D.

Carrel, A., and Du Nouey, P. L.: Cicatrization of Wounds. XI. Latent Period. *J. Exper. M.*, 1921, xxxiv, 339.

The latent or quiescent period of cicatrization extends from the time of traumatism to the beginning of contraction. During this stage of apparent inactivity the mechanism which will bring about the reintegration of the tissues is progressively set in motion. A study of this period may lead to a better understanding of the secondary causes directly or indirectly derived from the injury which act as primary causes and are instrumental in starting regeneration. The purpose of the investigation reported in this article was to determine the duration of the latent period and to study its transition to the period of contraction and the characteristics of the curve expressing it.

The experiments were made with wounds of geometrical shape in the dorsal region of dogs. The animals were of medium size, short haired, and of quiet temper. Twenty-four hours previous to the operation their hair was clipped and they were given a warm bath. Later on the same day the skin of the dorsal region was washed a second time with soap and water. After the animal had been etherized, the skin was shaved, carefully washed with

soap and warm water, and covered for ten minutes with compresses soaked in 75 per cent alcohol. The animal was then placed on the operating table and the skin painted with a 10 per cent tincture of iodine. This was allowed to dry for ten minutes. The wounds were made by resecting a rectangular flap of skin. Hemostasis was obtained by compression with gauze pads or temporary clamping of the small vessels. The skin of the dog is mobile and therefore the size of a wound becomes modified by slight changes in the animal's position. As the authors' purpose was to study only the latent period under ordinary conditions, the dressing consisted merely of talcum powder, paraffin, or plain gauze. As a rule the gauze carried infection to the wound from the surrounding skin.

It was found that the duration of the latent period varied from five to seven days and was modified by many causes, such as mechanical irritation of the tissues, infection, and diet. During the first stage of healing the area generally remained constant. When the edges of the wound were not fixed to its base by granulating tissue a slight change in the tension of the surrounding skin modified the area considerably. The end of the latent period was generally indicated by the appearance of granulation tissue and also by an abrupt beginning of the contraction period. The contraction period usually acquired its maximum velocity immediately but in two of the experiments there was a transition period which lasted possibly for twenty-four hours, during which time the contraction started very slowly.

The formula of DuNouy was found to apply accurately to the beginning of the period of contraction. There was perfect coincidence between the calculated and the observed surfaces in one experiment, even during the first hours of contraction.

GEORGE E. BEILBY, M.D.

Leriche, R., and Haour, J.: The Effect of Peri-Arterial Sympathectomy on the Repair of Tissues and Cicatrization of Wounds (Du mode d'action de la sympathectomie périartérielle sur la réparation des tissus et la cicatrisation des plaies). *Presse méd.*, Par., 1921, xxix, 856.

It is undeniable that peri-arterial sympathectomy has a remarkable effect on the cicatrization of wounds. Experiments performed by the author indicate that this effect is due entirely to peripheral vasodilatation which after some hours is produced distal to the sympathectomized artery. The vasodilation is accompanied by an increase in the peripheral pressure and the local temperature. The circulatory hyperactivity seems to influence the repair of the tissues because, from its initiation, ulcerations assume a healthy color.

In the experimental work reported, which was performed on rabbits, similar wounds were made in each ear following the removal of the upper cervical ganglion of the sympathetic nerve on one side. The results showed that cicatrization proceeded more

rapidly in the wound of the ear deprived of its sympathetic innervation than in the control wound.

W. A. BRENNAN.

ROENTGENOLOGY AND RADIUM THERAPY

Wilsey, R. B.: The Effects of Scattered X-Rays in Radiography. *Am. J. Roentgenol.*, 1921, n.s.viii, 589.

It was the purpose of the author's experiments to measure the effects of scattered radiation under typical conditions and to compare the effects of reducing scattered radiation with the results obtained by other methods of improving the quality of radiographs of deep parts, such as the use of intensifying screens and reduction of the spark gap. The results were judged by the contrast and definition obtained.

To determine the effect of "undercutting" of scattered radiation comparative exposures were made of an object embedded in scattering material, with variation of the distance between it and the photographic film. It was found that the loss of contrast is quite marked as the object is moved away from the film, most of the decrease occurring within a distance of 2 in.

The effects upon contrast of various types of technique were investigated in a somewhat similar manner. It was found that contrast was markedly improved by the use of circular diaphragms, this improvement increasing with a decrease in the size of the cylinder. The use of double intensifying screens also increased the contrast as compared with the duplitized films without screens. Reduction of the spark gap had a similar effect. The use of filters between the scattering material and the film had no appreciable beneficial action.

Scattered radiation reduces the contrast in all parts of the radiograph; its greatest effect is upon portions of the subject at some distance from the film. The portions near the film, therefore, show up most clearly and those away from it show less clearly or not at all. The reduction of scattered radiation improves most the contrast in the portions of the subject away from the film, so that all portions show up in the radiograph more clearly according to their true absorption of the roentgen rays. Greater contrast could be secured by reduction of the scattered radiation than by the use of intensifying screens or reduction of the spark gap. This advantage was greatest for portions of the subject at a distance from the film.

For the experiments in definition wire gauzes with different-sized meshes were roentgenographed at various distances from the film with varying amounts of scattering material and with and without intensifying screens. The use of scattering material greatly reduced the definition, as did also "undercutting" of the scattering radiation. Reducing the intensity of the scattered rays by means of diaphragms produced a marked improvement in the definition. Tests of the definition of intensifying

screens made without scattering material showed that their definition was much poorer than that of plain duplitzed film. With scattering material this difference in favor of the plain duplitzed film became less as the thickness of the scattering media increased.

From this series of experiments it is apparent that there is no adequate substitute for an actual reduction in the intensity of the scattered radiation. Other methods of increasing the contrast do not have the same effect as the removal of scattered rays and do not give as much improvement in contrast or definition as can be obtained by a sufficient reduction of the scattered radiation. Most important of all, the removal of scattered radiation can give much better results than any other technique in the detection of faint differences in absorption. The only method of reducing scattered radiation to any considerable extent is the use of diaphragms. These may restrict the scattering by limiting the volume of material rayed or may be arranged, as in the case of the Bucky diaphragm, to prevent the scattered radiation from reaching the film.

In conclusion it is pointed out that the increased exposure required when scattered radiation is reduced constitutes an additional source of danger. Greater care must be exercised to avoid a roentgen burn. The Potter-Bucky diaphragms now in use require about three or four times the normal exposure, which means that one-third or one-quarter as many radiographs can be taken safely as by the ordinary technique without the diaphragm. To reduce the danger it is practically essential in most cases to use intensifying screens with the Bucky diaphragm.

ADOLPH HARTUNG, M.D.

Carman, R. D.: The Roentgenologic Aspect of Pulmonary Metastasis. *J. Radiol.*, 1921, ii, 1.

Pulmonary metastatic malignancy may occur regardless of the seat of the primary focus. It has no relationship to the extent or duration of the primary disease, and can be discovered in many instances only by roentgen-ray examination. The character of the primary growth cannot be predicted from the roentgenogram. Virchow stated that metastasis seldom occurs in organs in which tumors are commonly primary, and primary growths are rare in situations where secondary growths are common. This is true particularly with regard to the liver and lungs.

In the 196 cases of metastatic carcinoma studied at the Mayo Clinic from 1916 to 1921 there were 150 cases of mediastinal and hilus involvement and twelve of pleural involvement. Thirty-four of the metastases were of the nodular type, and ten of the miliary type.

The location of the primary lesion with pulmonary metastasis in 194 instances was: breast, 37; kidney, 18; thyroid, 17; lower extremities, 17; upper extremities, 12; testicle, 10; abdomen, 9; stomach, 7; colon, 7; not found, 7; neck, 6; mediastinum, 5; biliary tract, 4; rectum, 4; pelvis, 4; œsophagus,

3; chest wall, 3; and foot, bladder, prostate, larynx, anal region, back, and lung, 2 each; and lip, tongue, eye, parotid, brain, jaw, ovary, uterus, vulva, and buttock, 1 each. The character of the primary tumor was: carcinoma, 114; sarcoma, 44; hypernephroma, 15; not stated, 10; lymphosarcoma, 5; teratoma, 3; epithelioma, 3; glioma, 1; and endothelioma, 1.

The clinical manifestations of pulmonary metastasis are very indefinite. In 60 per cent respiratory symptoms were either absent, insufficient to justify mention, or trivial. As a rule the symptoms are not in proportion to the degree of involvement. The most frequent symptom was a dry, unproductive cough. None of the patients gave a history of night sweats. Physical signs were comparatively rare unless pleural effusion was present. The patients' general appearance was good except for anæmic pallor. Loss of weight was not a constant feature unless the nutritive functions were affected.

Most textbooks on pathology describe metastatic growths only as nodular. Roentgenologic experience, however, has demonstrated three types: nodular, miliary, and infiltrative.

The nodular type of metastasis, characterized by round, dense, homogeneous areas varying from 0.5 to 7 cm. in diameter, is the most common.

The miliary type consists of a shower of innumerable, round or irregular, small, discrete areas of increased density. The lesions often are uniformly distributed in both lungs and vary in size from 4 mm. to 1 cm.

The infiltrative type consists of an infiltration extending from the hilus along the bronchial markings. There was no case of this type in the series reviewed. Careful differentiation from primary carcinoma of the bronchus or mediastinum, Hodgkin's disease, and syphilis is necessary.

Lesions which simulate the nodular type of metastasis are cysts, abscesses, interlobar effusions, Hodgkin's disease, and syphilis.

In acute miliary tuberculosis the lesions are more numerous, smaller, and less dense than in miliary metastasis. Tubercles grow by forming conglomerate masses and are therefore irregular in outline and tend to form cavities. In metastasis the growth proceeds by uniform peripheral extension; in tuberculosis the bases of the lungs are relatively clear.

The differential diagnosis of metastasis from pneumoconiosis is seldom difficult. Pancoast, Miller, and Landis have noted three stages in the development of pneumoconiosis: (1) an increase of the hilar and trunk shadows and prominence of the linear markings; (2) mottling throughout the lung structure involving especially the middle portion opposite the hilus; and (3) a diffuse, dense fibrosis resembling consolidation.

Atypical cases of pneumoconiosis, miliary tuberculosis, and miliary metastasis may be easily confused. The roentgenologist should be informed as to the patient's age, sex, and occupation as well

as the presence or absence of the primary focus so that he may correlate the roentgenological and clinical findings.

MERLE R. HOON, M.D.

Sherren, J.: The Value of Pathological and X-Ray Examinations in Abdominal Surgery. *Lancet*, 1921, cci, 689.

The status of a hospital is dependent on its special departments, especially the pathologic and X-ray laboratories. In the diagnosis of diseases of the abdomen the history stands first in importance. In other conditions, such as fractures, the X-ray takes preëminence. All laboratory facilities should be at hand.

In acute abdominal conditions the decision as to treatment must be made on the basis of the history, physical examination, and urinalysis, without delaying for long investigations which would permit the damage to the intestine to increase. In a case of postoperative appendicitis with a low temperature a high leucocyte count points to a residual abscess. When there is dullness at the right base and no displacement of the heart, the X-ray locates the fluid above or below the diaphragm, thus guiding operative interference.

The X-ray is necessary to rule out renal stone in cases of so-called appendicitis with iliac pain on the right side. Perforating duodenal ulcer, and in women, tubal pregnancy or inflammation must be ruled out, although the latter does not usually require an emergency operation.

Special investigations are necessary to give confirmatory evidence in cases which can be diagnosed from the clinical evidence, but are especially necessary when the symptoms are confusing. In two cases of supposedly renal pain the X-ray showed an hour-glass stomach with a posterior ulcer eroding the pancreas in one and malignancy of the splenic flexure of the colon in the other. Diseases of the stomach, gall-bladder, and appendix may all cause pain in the left iliac fossa and must be differentiated from ureteral calculus. The X-ray cannot be relied upon to prove the presence or absence of gall-stones. The pain never begins in the gall-bladder region but is epigastric and occasionally on the left side.

The X-ray diagnosis of visceroptosis is of doubtful value because this condition is rarely helped surgically.

Routine examination of a patient with gastric symptoms takes note of the rate of passage of the food, especially through the stomach, as stasis indicates cancer or chronic scarred ulcer near the pylorus. The peristalsis and tone and the presence or absence of filling defects or an hour-glass stomach are noted. In the hour-glass stomach the two pouches do not fill simultaneously. The spasmodic type does not usually indicate ulcer.

The use of the barium enema offers the best aid in the X-ray examination of the colon. In angulations, enlargements, changes caused by diverticulitis, and especially in carcinoma, it is of great importance. The sigmoidoscope should be used if there is a

possibility of carcinoma of the lower bowel. The history of pain or diarrhoea is often disregarded and carcinoma of the bowel is overlooked. If surgical treatment is instituted early, the prognosis is good. There may be colicky pain, either general or in the right iliac fossa, which simulates both that of carcinoma of the lower bowel and that of appendicitis. A more common error is made in the differential diagnosis of carcinoma of the cæcum and a mass due to disease of the appendix. Both may cause midline colicky pain. In the first condition the X-ray shows an irregular filling defect and in the second a narrowing of the cæcum from external pressure. Not infrequently carcinoma of the sigmoid is confused with carcinoma of the gall-bladder. Pain on the left side is more common in cholecystitis. The cause of diarrhoea should be investigated by stool examinations and the X-ray.

The fractional test meal has no particular advantage over the one-hour meal. It is used chiefly in chronic duodenal ulcer and certain cases of carcinoma, and to determine the prognosis after gastric operations.

Examination of the central nervous system and, at times, a Wassermann test are necessary to exclude tabetic crises in certain abdominal cases. A gumma has been mistaken for carcinoma of the gall-bladder or stomach even when the X-ray seemed to indicate the latter.

In cases of chronic gastric ulcer the test meal is of no value. In an hour-glass stomach the acidity may be low and the condition diagnosed as carcinoma. The diagnosis is more difficult in women than in men. Gastric ulcers may not be demonstrated by the X-ray and, on the other hand, gastric symptoms may be reflex, being due to operable conditions elsewhere in the abdomen which are not demonstrable by the X-ray.

In over 50 per cent of the cases carcinoma of the stomach arises from chronic gastric ulcer and is hence preventable. The number of operable cases without a gastric history is very low. Patients often seek advice early but the symptoms do not seem to warrant operative interference. Every case of gastric disturbance in an adult should be regarded with suspicion. Loss of free hydrochloric acid and low total acidity should justify operation; if we wait for absolute certainty, operation is useless.

X-ray examination often fails to show early carcinoma, occasionally even in inoperable cases. In cases of carcinoma developing on chronic ulcer it may sometimes be possible to make the diagnosis only by means of the microscope.

C. JAMESON, M.D.

Georgescu, A.: Radiology of the Duodenum (Radiologie des Duodenum). *Spitalul*, 1921, xli, 175.

The physiological form of the duodenum appears in the X-ray picture as follows:

1. The bulb or ampulla of the duodenum is seen in the form of an ellipse, a rhombus, a triangular or

round spot like a helmet over the pylorus with which it is connected by a narrow and scarcely visible canal. It becomes filled a short time after the ingestion of a contrast meal, and during the entire emptying time of the stomach retains a certain portion of contents.

2. The upper portion forms an angle open at the bottom, at the apex of which there is occasionally an air vesicle.

3. The descending portion.

4. The lower portion which often runs diagonally upward to the duodeno-jejunal flexure.

If the pylorus is drawn far toward the right the descending portion forms a horseshoe open toward the left. In a greatly dilated duodenum, as in cases of stenosis, the Kerkring folds are visible. Duodenal diverticula are congenital and usually located in the descending portion. They have a wide opening into the duodenum. The test meal remains within them as long as twenty-four hours but can be forced out by palpation.

The duodenal ulcer develops exclusively in the bulb. The duodenal ulcer has both direct and indirect roentgenological signs. The direct are: (1) the ulcer niche (Haudek); (2) the filling defect; (3) clover-leaf form (Holzknecht) with more or less dentated edges; (4) dentated bulbus (Bier); (5) bulbus bilocularis (hour-glass form); (6) asymmetry of the bulbus with regard to its axis; (7) marked filling with active peristalsis; (8) persisting bulbus spot (Barkley); (9) phthisis bulbi (Freud) with scarcely visible filling; (10) transient filling, the bulbus emptying itself immediately after it becomes full (Eisler).

The indirect signs are: (1) hyperperistalsis; (2) hypertonicity; (3) increased secretion; (4) increased motility with pyloric insufficiency; (5) in long-standing ulcers, dilatation of the stomach.

The diagnosis of ulcer of the duodenum can never be determined by X-ray examination alone but only when the X-ray picture is considered with the clinical findings. In the differential diagnosis consideration must be taken of pyloric ulcer, chronic cholecystitis and pericholecystitis, chronic appendicitis, kidney and gall-stones, pancreatitis, neurasthenia with hyperchlorhydria, hysteria, tabes, lead poisoning, and nicotine abuse, in all of which the form and function of the stomach and duodenum may be similar.

STAHL (Z).

Schreiner, B. F., and Kress, L. C.: A Study of Eighteen Cases of Epithelioma of the Penis. *J. Radiol.*, 1921, ii, 31.

The authors give a brief review of the history of epithelioma of the penis and discuss its incidence, etiological factors, pathologic findings, and clinical course.

Twelve of their eighteen cases were treated by surgery, radium or roentgen therapy, or combinations of these methods, with variable effect. Six were treated with the roentgen ray alone. From the results it would seem that when the disease is local

a cure can be effected with the unfiltered roentgen ray but it is necessary to bear in mind not only the local lesion, but also the areas into which the lymph channels drain. The ideal therapy appears to be filtered roentgen-ray treatment of both groins, and unfiltered roentgen-ray treatment of the local lesion with from two to three times the erythema dose. When there is definite lymphatic involvement in the groins, the use of large radium packs supplemented by operation, the implantation of emanation, or operation and unfiltered roentgen-ray treatment of the open wound is indicated. As a rule the roentgen-ray treatment of these cases consisted of 10 milliamperes, 90,000 volts, and no filter at a distance of 20 cm. The time varied from five to six minutes, approximately two to three times the erythema dose.

The following conclusions are arrived at:

1. Cancer of the penis can be healed with the unfiltered roentgen ray.

2. Roentgen-ray treatment of the lesion followed by radical operation has resulted in healing in three cases, and the patients remained well for two, three, and four years.

3. When definite metastases are shown in the lymph-bearing tissue treatment has been only palliative or ineffective.

4. The implantation of small doses of emanation, supplemented by the use of large packs will prove of value in cases in which metastases have already developed in the lymph nodes.

ADOLPH HARTUNG, M.D.

Leitch, A.: The Immediate Effects of the X-Rays on the Blood Lymphocytes. *Arch. Radiol. & Electrotherapy*, 1921, xxvi, 122.

This paper is offered as a reply to that of Russ (*Lancet*, April 26, 1919, p. 693). Experiments are reported to show that a short exposure to X-rays produced in rats a great reduction of the lymphocytes circulating in the blood. This reduction reached its highest point in an hour or so but in twenty-four to forty-eight hours the normal level was regained. Other varieties of the white blood corpuscles may be affected but this was inconstant; the diminution of lymphocytes was the invariable and specific response to radiation.

The fate of the destroyed corpuscles could not be ascertained. Russ suggested that there are two kinds of lymphocytes, indistinguishable by microscopic methods, one of which is vulnerable to the X-rays and the other is not. As only the latter would remain after irradiation, subsequent exposures could not be expected to produce further diminution until another supply of vulnerable lymphocytes became available.

Leitch gives his technique in detail. He concludes that the diminution of lymphocytes which usually occurs when rats are exposed to the X-rays for a short time is not produced by the influence of the radiations but is a fright reaction due to the manipulation necessary for the X-ray exposure and the

taking of the blood specimen. In some cases normal variation may explain the findings. Therefore we may dismiss from our minds the fear that small single doses of X-rays may have a harmful effect upon the blood corpuscles. No opinion is expressed regarding the effect of large or repeated exposures.

DAVID R. BOWEN, M.D.

Skinner, E. H.: Some Phases of Intensive Radiation Therapy. *J. Radiol.*, 1921, ii, 26.

Among the conditions which lend themselves to uniformly successful results with radiotherapy are: (1) enlargement of the thymus in infants and young children; (2) tinea sycosis; (3) epitheliomata of the face, from the eyebrow to the upper lip; (4) keratosis senilis; and (5) tinea favus. Any of the commonly accepted techniques will produce satisfactory results in the treatment of these lesions. For eczema, psoriasis, erythemata, carbuncles, keloids and other conditions, radiotherapy is only one of many methods which are available but should be used only in properly selected cases and with a most careful technique.

Regarding deep therapy problems, more especially in relation to malignancy, the following laws have been laid down: (1) the sensitiveness of the malignant cell to exposure to radiation is in direct proportion to the activity of its reproductive power; (2) immature cells and cells in an active state of division are more sensitive to radiation than cells which have already acquired their fixed adult morphological or physiological characteristics; (3) infection interferes with the results of radiation therapy; (4) inoperable is not synonymous with incurable.

The purposes of radiotherapy have been outlined by Finzi as: (1) the prevention of inoculation of tumor cells into a wound; (2) the destruction of a growth *in situ*; (3) the relief of pain and discomfort; (4) the rendering of inoperable growths operable.

The laws of the biological action of radiation have been outlined by Kroenig and Friedrich as follows: (1) the biological action of the rays depends on the quantity of rays absorbed by the tissues; (2) within wide limits this action is independent of the hardness of the rays; (3) the action is more powerful if the dose is administered at one time than if it is split up; (4) the action is stronger with the stronger intensity of irradiation in unit time; (5) in practice, therefore, it is best to apply the whole dose in one séance with the maximum intensity.

The question of sepsis in malignant tissues subjected to radiation has not received the attention it deserves. Practically nothing is accomplished unless the infection is controlled. No effect is exerted by the rays upon bacteria by any technique in ordinary use. Hence radiotherapy must be supplemented by other measures if favorable results are to be obtained.

The author gives an anatomical classification of the tissues and their peculiar diseases which are amenable to radiotherapy. He refers also to a classification of tumors outlined by Finzi which was

based on pathologic findings and in which the indications and contra-indications for radiotherapy are given. Contrary to Finzi, he places cancer of the fundus of the uterus in the operable class and cancer of the cervix among the conditions suitable for radiation therapy. Cancer of the penis he includes with those for which radiation is contra-indicated.

ADOLPH HARTUNG, M.D.

Dessauer, F.: My Studies on the Physical Foundations of Deep Therapy Treatment. *Am. J. Roentgenol.*, 1921, n.s. viii, 578.

These studies were conducted with a two-fold object: (1) to ascertain the physical laws of irradiation and gain exact knowledge of the distribution of the rays within the tissues, and (2) to determine the technical requirements for a practical solution of the problem.

Successful results in the roentgen therapy of superficial lesions and the lack of such results in similar conditions located deep stimulated efforts to produce physical conditions which would permit equally good results in deep-seated lesions. Roentgen rays (and these are essentially a mixture of different rays) penetrating some distance below the surface differ quantitatively and qualitatively from those striking the surface because of absorption and increased distance. The aim was to produce a more nearly homogeneous irradiation applicable to deep therapy.

The author has formulated a number of laws of homogeneous irradiation which, in abbreviated form, are as follows:

1. The foundation of roentgenotherapy is formed by the biological experience that different cell forms show different sensitiveness to the same roentgen rays.

2. So long as the contrary is not proven, rays of different penetration are to be regarded as different medicaments. The difference in sensitiveness of different cells appears more marked if hard rays are applied.

3. In order to determine and utilize precise differences in sensibility, the homogeneity of the field of radiation is a required condition.

4. The non-homogeneity of a treated field detracts from the effect. The conditions for a favorable influence upon the disease are not fulfilled when the non-homogeneity of the field is greater than the difference in sensitiveness between the diseased and the normal cells.

5. There is a homogeneity of space or a quantitative homogeneity, and a specific homogeneity or a qualitative homogeneity. The aim must be to dose the diseased cells of the entire diseased zone throughout its extent with the needed quantity or dose of irradiation and to have this dose of the same quality throughout.

6. The condition of qualitative or specific homogeneity is fulfilled when the irradiation in the complete zone during its course through the body does not change its composition or consistency. The

reaction on the different cells is then dependent physically only on the intensity and the time.

7. The intensity of effect may not differ more than the degree of sensitiveness. This is only a more precise statement of the fourth law, the limit of effect, but one may try to increase the intensity on the diseased zone in the depth and to raise it above the intensity on the surface and in the vicinity of diseased cells.

For a number of years the author has made a great many measurements to ascertain dosage in deep tissues. On the basis of these measurements he has been able to plot out certain "distribution diagrams" which give the intensity of radiation for different qualities of rays at variable focal distances. By overlapping a transparent sketch of any required one of these over cross-section sketches in the frontal and sagittal planes with the lesion schematically indicated in them, it is possible to determine accurately the dosage that can be given to all parts of the lesion. Thus it is possible to determine beforehand whether lethal doses can be applied to all parts of the lesion without injuring any of the adjacent structures and also the angles at which the ray must be applied to get this result. There are valid objections to the method, but it is hoped that further study will overcome them.

In the electrical and technical studies it was necessary to meet two requirements:

1. The invention and development of roentgen-ray tubes which would stand very high voltages continuously.

2. The invention and development of electrical apparatus which would generate safely very high voltages with great reliability and safety from breakdown.

The solution of the first problem was met by the Coolidge tube. The author has solved the second by the invention of a transformer, the principles of which he describes in detail. Essentially it accomplishes:

1. The separation of the problem of "transformation" from that of "insulation" in the construction of a transformer.

2. Intentional holding of the energizing winding of a transformer at a different potential from earth than the feeding mains.

3. Holding the energizing winding at such a potential that the insulating strain from the secondary winding to the primary is reduced far below the danger zone.

4. The subdivision of the secondary coil.

This new transformer is compact, light, inexpensive, and capable of producing high voltages with absolute safety and without danger to the insulating material when operating ten hours daily throughout the year. By the addition of new parts the voltage can be raised to meet new requirements if such arise. By its use it has been made possible to introduce such constancy in the work of various clinics that the conditions may be produced over and over again.

ADOLPH HARTUNG, M.D.

Russ, S., Chambers, H., and Scott, G. M.: On the Local and Generalized Action of Radium and X-Rays upon Tumor Growth. *Arch. Radiol. & Electrotherapy*, 1921, xxvi, 129.

Investigations were carried out to determine: (1) the effect of the rays, in various doses, upon malignant cells before inoculation, (2) the effect upon normal animals as to body growth and subsequent inoculation with malignant cells, and (3) the effect upon animals which are bearing tumors. The experimental animals were rats affected with three distinct types of tumor but principally with Jensen's rat sarcoma.

After tabulating and analyzing their results, the authors conclude that small variations from the lethal dose appear unimportant, but if the proportion of radiation reaching outlying parts of the growth is diminished to a small dose (a small percentage of the lethal dose) it might have a stimulating instead of a destructive effect. There seems to be ample evidence that large generalized doses of radiation lower the normal resistance to tumor growth, and that this result is completely reversed when the normal animal is given very small generalized doses repeated at frequent intervals.

DAVID R. BOWEN, M.D.

LEGAL MEDICINE

Barred Testimony of Physician and of Assistant. *Manufacturers' Life Ins. Co. vs. Brennan et al. (U.S.)*, 270 Fed. R., p. 173.

A physician or surgeon or the assistant of either of them cannot, without the consent of the patient, be examined in a civil action as to any information acquired in attending the patient which it was necessary for him to acquire in order to prescribe or act for the patient. However, this does not apply in an action between a physician or surgeon and his patients in which the treatment of the patient by the physician or surgeon is at issue. In an action brought by the beneficiary to recover on a policy of life insurance taken out by the person whose life was insured a physician or surgeon may testify, with the consent of the beneficiary, as to any information acquired by him in attending the deceased, but cannot be compelled to so testify.

In this case, which was an action brought by the beneficiaries on a life insurance policy, a physician testified that he had attended the insured seven or eight times, including two or three times during his last sickness; also, without objection, that he had certified that the cause of the insured's death was pulmonary tuberculosis. Counsel for the insurance company then addressed to the physician as an expert a series of questions intended to bring out the reasons for his opinion that the insured died of pulmonary tuberculosis.

In affirming a judgment in favor of the beneficiaries the court held that a ruling excluding such questions on objection was correct. There was no evidence warranting a finding or ruling that the

beneficiaries had waived their rights under the statute. It was equally plain that if the physician had been permitted to answer the questions or, as it was said, to testify at length and fully as to the cause of the death of the insured, he would have based his testimony in large part, if not entirely, on information which was acquired by him in attending the insured as his patient and presumably necessary to enable him to prescribe for the patient.

The court held also that when the physician, who was a bacteriologist employed in laboratory work as an intern in a hospital, was called on by the insured to make an examination of his sputum, his testimony tending to show that the sputum indicated tuberculosis was, on a motion therefor, properly stricken from the record as the statute required the exclusion of the evidence as to any patient coming to the hospital and the insured had been brought to him by the medical director of the hospital who, as a physician, had been consulted by the insured

and testified that the bacteriologist was an assistant under his direction.
J. A. CASTAGNINO.

Errors of Surgeons No Defense for Wrongdoers
Ryder vs. Findlay N. Y., 187 *N. Y., Supp.*, p. 579.

The defendant in this case was sued for damages for causing the death of a man in an automobile collision. The Supreme Court of New York affirmed an order setting aside a verdict in his favor and granting a new trial because the trial judge, when a juror asked, "Suppose we find that the deceased would not have died except for the negligence of the physician?" replied, "If he would not have died except for the negligence of the physician, then there can be no recovery here against the defendant." The court stated that this answer may have given an erroneous impression. The rule is that an original wrongdoer whose acts inflict injuries that might result in death is not relieved by errors of a surgeon or nurse in the treatment of the injury.
J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Vineberg, H. N.: Vaginal Supracervical Hysterectomy with Interposition of the Cervical Stump for Cystocele and Procidentia Associated with Enlargement of the Uterus. *Am. J. Obst. & Gynec.*, 1921, ii, 368.

The steps of the operation are as follows:

1. A longitudinal incision is made in the anterior vaginal wall extending from near the urethral meatus to within an inch or an inch and a half of the cervical os.

2. The vaginal flaps are separated from the underlying bladder by sharp or blunt dissection.

3. The bladder is pushed up from the uterus and the base of the broad ligaments by gauze or scissor dissection.

4. A transverse incision is made in the vesico-uterine fold.

5. The body of the uterus is delivered through the vaginal incision.

6. If the ovaries are to be retained a ligature is passed around the ovarian ligament and the uterine end of the tube on either side and the tissue is cut between the ligature and the uterus. If the ovaries are to be removed the ligature is passed around the infundibulo-pelvic ligament containing the ovarian vessels.

7. A ligature is passed at the level of the internal os on either side to embrace the uterine artery. The body of the uterus is then amputated at the desired level by a curved incision with the concavity toward the cervix. The edges of the wound on the cervical stump are carefully coapted by chromic catgut sutures. If the patient is under 40 years of age and it is desirable to retain the menstrual function, the incision should be made higher up so that a portion of the body with the corporeal endometrium is left with the cervical segment. This was done in a few of the cases and menstruation, though scanty, was preserved.

8. The cervical stump is fixed to the subpubic ligament in the following manner: A chromic catgut suture is carried laterally for the distance of about an inch through the subpubic fascia and underneath the vaginal mucosa, then brought through the cervical stump from behind forward, and then carried through the subpubic fascia in the opposite direction from the other side. The vesico-uterine peritoneum is purposely avoided in this suture. When the suture is tied, the cervical stump is brought up tightly against the raw tissues underneath the pubic area. A firm union results. With such a solid plug fixed to the subpubic ligament it is impossible for the bladder to come down. If the vaginal portion is eroded, lacerated, hyper-

trophied, or considerably elongated, it is amputated in a suitable manner and the resulting wound carefully coapted by chromic catgut sutures.

The uterus is regarded as too large when it is the size of the gravid organ at the fifth or sixth week and when its walls are very thick and hard.

In 309 successive cases of procidentia and cystocele there were eighty-three (37.2 per cent) in which the uterus was too large for interposition. There was one death in the author's own series of fifty-seven cases, a mortality rate of 1.8 per cent, and one death in twenty-six cases operated upon by others. The mortality of the combined series of eighty-three cases was therefore 2.4 per cent. Suppuration in the bed of the interposed cervix occurred in six cases. When the upper angle of the wound was opened the process rapidly disappeared except in two cases in which it took two and three weeks, respectively, to clear up. The final anatomical result was not impaired by the complication.

As nearly all of these cases are associated with marked congestion of the tissues and engorgement of the blood vessels Vineberg usually inserts a small gauze drain between the vaginal flaps and the cervical side of the stump and removes it in forty-eight hours.

In the series of thirty private cases reviewed recurrence of the prolapse of the vaginal walls and prolapse of the cervical stump to the introitus occurred in one case, one of the first five operated upon. However, the parts have been easily kept up by means of a small ring pessary. This was not possible prior to the operation. One patient continued to complain of a great variety of pelvic symptoms although the anatomical result was good.

The data of the ultimate results of the hospital series of fifty-three cases are very meager as the follow-up clinic in the hospital has not been fully developed.

E. L. CORNELL, M.D.

Van Hook, W.: The Operation for Prolapsus Uteri. *Boston M. & S. J.*, 1921, clxxxv, 438.

The author's procedure to restore all possible supports of the pelvic outlet at once after removal of the uterus coincides with that of Mayo though the idea was worked out independently.

Because of the anatomical changes due to the prolapsus, a study of the surrounding structures is very important. The structures which have functions in the pelvis and also act as supports are chiefly: (1) the perineum, including the levator and pelvic fascia, (2) the vesical fascia, (3) the uterine round ligaments, (4) the broad ligaments, (5) the uterosacral ligaments, and the (6) fascia pelvica.

Van Hook describes his technique as follows:

Under ether anæsthesia the anterior vaginal wall is split from a point just posterior to the meatus backward to the cervix, and the bladder is exposed by dissection. The uterus having been removed, the broad ligaments are brought together and made to overlap one another beneath the bladder, and the pelvic fascia and vaginal wall are brought together with stitches that unite the broad ligaments to the base of the bladder and the anterior vaginal wall.

Simultaneously the round ligaments are fastened into the upper anterior vaginal wall, and the uterosacral ligaments are exactly sutured in the elevated vaginal opening.

After the cystocele is abolished and the rectocele exposed by splitting the posterior vaginal wall the levator ani and fascial structures are reunited. When the abdomen is then opened, the patient being in the Trendelenburg position, the direction of the broad ligaments is observed to be slightly changed, with the uterosacral running to the same point in the pelvis.

The round ligaments are shortened still further, and the upper margins of the broad ligaments brought together more closely with chromicized catgut sutures.

The most important part of the intra-abdominal work is completed in the lifting up and the reefing of the pelvic fascia over each internal iliac fossa so that the peritoneal sac is shortened in its longitudinal axis.

In this operation the author claims there is no sacculation of the bladder or rectum, the vaginal vault is well elevated into position, and all the supporting structures of the pelvic outlet are utilized as far as practicable.

C. H. DAVIS, M.D.

Béclère, A.: Roentgenotherapy of Fibromyomata of the Uterus: Three Hundred New Cases (Sur la roentgentherapie des fibro-myomes uterins d'après trois cents nouvelles observations). *Bull. Acad. de méd.*, Par., 1921, lxxxvi, 151.

Two years ago at Brussels Béclère reported his results in 400 cases of uterine fibromyomata treated with the X-rays. This report deals with 300 similar cases.

Two hundred and three of the patients were between 40 and 50 years of age and forty-eight were 50 years old or older. Two hundred and twenty-six of the tumors were abdominal and 24 were intra-pelvic.

The two principal results of the treatment were the disappearance of the metrorrhagia and suppression of the menstrual function in 294 cases and a more or less rapid and definite regression of the uterine tumor. The reduction of the volume of the growth began with the first treatment but usually did not become appreciable until the third, although in some cases it could be noted at the second treatment. From week to week the upper pole of the tumor more or less rapidly approached the symphyseal pubis.

Of the 294 patients who had not passed the menopause only ten had recurrences. The youngest was 36 and the oldest 47 years of age.

In 90 per cent of the cases the total duration of the roentgen treatment was less than four hours; in 68 per cent it was less than three hours; and in 13 per cent, less than two hours. The dose given in five minutes and measured by the light of an electric lamp with the aid of a Sabouraud-Noiré pastille and the radiometric Holzkecht scale seldom exceeded 3 Holzkecht units and the maximum was $3\frac{1}{2}$ units. As a general rule each radiation lasted five minutes but in exceptional cases was prolonged for ten minutes.

Roentgen treatment is contra-indicated only by acute complications such as torsion of the pedicle of the tumor, severe hemorrhage, and sepsis.

Béclère concludes that in most cases of fibromyomata of the uterus roentgentherapy is the method of choice as it almost always results in recovery without danger and without interrupting the patient's occupation.

W. A. BRENNAN.

Warthin, A. S., and Noland, L.: The Differential Diagnosis of Chancre and Carcinoma of the Cervix. *Am. J. Syphilis*, 1921, v, 553.

The authors agree with Gellhorn and Ehrenfest as to the importance of the differential diagnosis of syphilitic lesions of the cervix. In eight cases of chancre and six cases of late syphilitic lesions of the cervix seen during the last six years syphilis was not suggested clinically. In one case a hysterectomy had been done for supposed carcinoma; in four, an amputation; and in the remainder diagnostic excisions for suspected malignancy. On the other hand, no case of carcinoma of the cervix was incorrectly diagnosed clinically as syphilis.

A case of primary syphilis of the cervix is reported in which the clinical appearance so convincingly suggested carcinoma that a total hysterectomy was performed. Following the patient's discharge from the hospital cutaneous lesions appeared in association with a positive Wassermann reaction. The patient then brought suit for damages on the ground that she had been infected with syphilis while in the hospital, and her husband who also showed signs of syphilis sued for damages on the ground that he had received his infection from his wife.

Fortunately the patient's uterus had been preserved in 10 per cent formalin. At the time of the threatened suit it was sent to the pathological laboratory of the University of Michigan for pathological examination and diagnosis, the pathologist being asked to examine for malignancy.

After three months in formalin the cervix still showed well the appearances that had been interpreted clinically as carcinoma. It was enlarged, indurated, and irregularly nodular or cauliflower-like. Its surface showed a shallow ulceration covered with a thin, grayish membrane about the size of a silver dollar which completely encircled the external os, involved the entire vaginal portion,

and was more nodular on the anterior lip. Its consistency was very hard, but there was no crumbling. On section the erosion was found to be very shallow, not deeper than the loss of the surface epithelium. Beneath this the cervical tissues showed a uniform, dense, and firm infiltration throughout. Within the uterus were several small myofibromata the size of large peas. The wall was thick and firm and the endometrium presented no changes to the naked eye.

Sections from the cervix showed a loss of the surface epithelium over the greater part of the induration. Very few polymorphonuclear leucocytes were found in this surface layer. The superficial portion of the cervical tissue presented a zone of dense infiltration about 1 cm. in breadth which consisted almost entirely of mononuclear cells, most of which were of the large lymphocyte or plasma-cell type and arranged in rows or cords throughout the tissue spaces or concentrically around the blood vessels and lymphatics.

In the next deeper zone, which had a greater capillary development, the cellular infiltration seemed more marked and the endothelial proliferation greater. In this zone angioblastic budding and sprouting were evident.

In the next deeper zone the tissues presented a more striking perivascular arrangement, the vessels being concentrically thickened by the cords of mononuclear cells of the lymphocyte or plasma-cell type packing the perivascular lymph spaces. Between these larger, concentrically thickened vessels was a more dense infiltration due to the endothelial hypertrophy and proliferation in the smallest capillaries and lymphatics, particularly the latter.

Primary cervical chancre has no truly characteristic clinical features. The diagnosis can be made from its pathologic appearance and the demonstration of the spirochæta pallida in the lesions.

E. L. CORNELL, M.D.

Smiley, I.: Prophylaxis in Carcinoma of the Cervix.
N. York M. J., 1921, cxiv, 384.

The morbidity and mortality of operations for cervical cancer at the present time approximate 40 to 50 per cent. It has been established that chronic endocervicitis is a precursor of cervical cancer. Tracheloplasty correctly executed is a cancer prophylactic; hence the teaching, still advocated by some, that all tracheloplastic procedures should be postponed until after the child-bearing period is both fallacious and pernicious as such delay exposes the irritated cervix to further traumatism.

E. L. CORNELL, M.D.

Boggs, R. H.: The Treatment of Carcinoma of the Cervix and Uterus by Radium Supplemented by Deep Roentgen Therapy. *N. York M. J.*, 1921, cxiv, 381.

Radical operations, alone or with inefficient superficial treatment with 25 to 50 mg. of radium and without the aid of deep roentgen therapy, are inefficient. It is difficult to draw conclusions from

cases treated by radiation because of widely varying technique which in most cases is careless and does not include deep roentgen therapy. Removal of the local lesion is not the most important factor. Efforts must be directed also against involvement of lymphatic tissue throughout the lower part of the pelvis which is often impalpable and invisible.

Radium destroys disease at a greater distance than the knife. Therefore the only safe method consists of raying the pelvic glands in all cases, regardless of the stage of the disease.

In about 40 per cent of the cases of inoperable carcinoma of the cervix the pelvic nodes are free from metastasis. This accounts for brilliant results obtained in moderately advanced cases by radical operation or local radium treatment even with inefficient radiation of the pelvic lymphatics.

If we consider as operable a case in which there is no extension of the cancer cells beyond the cervix, three things will be accomplished by ante-operative treatment: the complete destruction of cells, the arrest of cell division, and the formation of productive inflammation to be followed by fibrosis. The first effect is obtained in from two to four weeks, but the fibrous formation will not take place until from four to eight weeks. During this time, in many cases of cancer of the cervix, the cancer cells disappear in the cervix and even to a considerable depth. It has been claimed that this has been accomplished with the actual cautery, but it should be remembered that radium will destroy cancer cells at a greater distance than heat. When radium is used as an ante-operative procedure the operation should be performed within four to eight weeks before marked fibrous formation has taken place.

When one considers that if no treatment is given about a third of the patients with cancer of the cervix die within a year, and that a large percentage of the remainder die within two years from the first manifestation of the disease and only a very few live three years, it is apparent that the amount of palliation and prolongation of life given by radium treatment means much. Today, radium is indicated as a palliative measure for hopelessly inoperable and recurrent cases and as an ante-operative procedure.

Boggs gives 3,000 milligram hours in the vagina, using 1½ mm. of brass and sufficient gauze and rubber to make 15 mm. of filtration. Three tubes are usually employed, one directed toward the cervix and one toward each broad ligament. These tubes are packed as far as possible from the rectovaginal wall, thereby lessening the danger of fistula formation unless the uterus is fixed. The organs are pushed higher up in the pelvis by the amount of packing used and thus more efficient treatment is given the deeper pelvic glands.

Involvement of the rectum is nearly always a late manifestation of the disease and the amount of radiation received by the rectovaginal wall is usually sufficient to destroy outlying cancer cells. As com-

pared with other tissues of the body, those of the cervix are relatively insensitive. It is always important to bear this in mind, but we must remember also that there is a limit to the amount of radium that can be used. Whenever it is possible to insert radium into the cervical canal it should be done because in this manner a cancer can be reached which could not be affected by tubes in the vagina.

Boggs has given 3,000 milligram hours of treatment in the cervical canal in addition to 3,000 milligram hours of treatment in the vagina.

DAVID R. BOWEN, M.D.

Norris, C. C., and Rothschild, N. S.: A Histologic Study of the Effects of Radium on Carcinoma of the Cervix. *Am. J. Roentgenol.*, 1921, n.s. viii, 604.

The authors believe that the histologic changes following radium therapy occur in five stages. The first three, the inflammatory reaction, early nuclear and cytoplasmic changes, and intercellular changes, occupy a week each. The stage of destruction continues from the fourth to the ninth week and is followed by the stage of healing.

The features of the changes are the changes of the malignant cells leading to their destruction and ultimate absorption and their replacement by fibrous tissue. "It must be acknowledged that the stages blend, and one may find many instances of early cellular changes with cells in the stage of destruction."

DAVID R. BOWEN, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Erdmann, J. F., and Spaulding, H. V.: Papillary Cystadenoma of the Ovary. *Surg., Gynec. & Obst.*, 1921, xxxiii, 362.

This article includes a discussion of the etiology, pathology, pathogenesis, symptoms, diagnosis, prognosis, and treatment of papillary cystadenoma of the ovary. This condition is the most important surgical disease of the ovary, occurring in from 10 to 27.5 per cent of ovarian tumors and frequently in women under the age of 30.

The lesion is bilateral in 22.2 per cent of the cases, with local metastasis. General metastasis is not rare; therefore careful examination of the abdominal viscera and the breasts is necessary.

The absence of symptoms referable to pelvic organs is a deceptive feature of the disease. Every woman with ascites not accounted for by some condition of the liver, heart, peritoneum, or kidneys should be subjected to a laparotomy even when a bimanual examination is negative.

Microscopic examination has demonstrated that 66.6 per cent of papillary cystadenomata are cancerous or precancerous. Therefore they must be removed intact by abdominal section. The vaginal approach cannot be too strongly condemned.

Radium should be employed in cases in which the ovaries or the peritoneal implants cannot be removed surgically.

R. E. CHRISTIE, M. D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Peterson. R.: Pneumoperitoneum and Roentgenology as Aids to More Accurate Obstetrical and Gynecological Diagnosis. *Am. J. Obst. & Gynec.*, 1921, ii, 349.

In none of 300 cases of gas inflation has there been any sign of peritoneal irritation. With the proper selection of cases and the proper technique there is no danger attached to the procedure.

The best results, so far as the X-ray plates are concerned, are obtained by the use of from 800 to 1,000 c.cm. of gas. Larger quantities quickly injected cause great discomfort and even pain.

In addition to acute pelvic disease, profuse purulent and bloody uterine discharges are considered contra-indications to the passage of the gas by the transuterine route. In such cases the gas is passed through the abdominal wall. This area, from the umbilicus nearly to the pubes and for a width of 8 in., is sterilized with iodine. A fold of the wall just below the navel is compressed laterally with the left hand, raised upward, and made tense. A spinal puncture needle is passed through the fold in a slightly upward direction at a spot in the median line $1\frac{1}{2}$ in. below the umbilicus. If the skin is made tense and the needle is sharp, no preliminary anæsthesia of the skin is necessary. The needle is passed downward until it meets the resistance of the fascia, the left hand still keeping the fold of the abdominal wall tense. The needle is then thrust through the fascia and peritoneum. A little experience gives accurate information to the hand when the peritoneum has been pierced. The stilet is then withdrawn from the needle and the latter connected with the rubber tube leading from the siphon meter. The latter is set by means of the pressure valve to about ten pulsations to the minute. Therefore it will require approximately four minutes at the rate of 25 c.cm. of gas at each pulsation for 1,000 c.cm. of gas to pass into the peritoneal cavity.

The objection that in case the needle does not pierce the peritoneum, the gas may be forced through the subcutaneous tissues is not valid, since by the manometer it can be told at once whether the gas is flowing freely into the cavity or is meeting an obstruction. When the needle has penetrated the peritoneum the manometer index rises first some fifteen or twenty points but falls usually immediately to almost zero. In case this fall does not occur the patient should be directed to take a deep breath. This will lift the point of the needle from anything which may be obstructing it.

The pelvic organs are represented on the plate by optical cross sections at the point of tangency of the projecting rays. The uterus is nearly always clearly

outlined and one can judge of its position, size, and contour. If not drawn to one side by adhesions or displaced by a neoplasm so that the ray catches it fairly as it is shot in the axis of the pelvis, the uterus will show two cross sections, one of the body and one of the isthmus or supracervical portion. It has been found that in cases of pregnancy the isthmus is greatly enlarged and extends more into the broad ligaments than in the non-pregnant state. So striking is the change in the isthmus that by this sign alone it has been possible to diagnose pregnancy by means of the X-ray as early as the sixth week and before softening can be determined definitely by the examining finger. The sign is constant from two and one-half months onward. Through the changes in the isthmus it has been found possible to diagnose positively the occurrence of pregnancy in a fibroid uterus at a stage when it could not be considered probable from the history and clinical findings. In a number of cases in which there was a possibility of pregnancy and menstruation was irregular it was possible to state definitely that the patient was not pregnant because of the size of the uterus and the absence of change in the isthmus.

The size of the ovary can be quite accurately estimated and usually it is possible to differentiate between the free and the adherent organ.

It is not so easy to see normal tubes unless the gas has been passed by the transuterine route when, because of their distention, they are quite clearly made out. They are especially clear when they are adherent to the sides of the pelvis and covered with plastic exudate.

Pelvic neoplasms if not so tightly wedged in the pelvis that the gas is prevented from surrounding them are clearly shown by the roentgenograms. Since it is possible to observe the outlines of the liver, spleen, and kidneys in pneumoperitoneal X-ray plates of these organs, it is usually possible to determine from the roentgenograms of the pelvis and upper abdomen whether neoplasms arise from the pelvis or elsewhere and this means of diagnosis is very much less painful and uncomfortable than catheterization of the uterus or other diagnostic measures.

It must be borne in mind that only about 300 patients have been subjected to the pneumoperitoneal X-ray. This means that, as compared with the tens of thousands of gastro-intestinal X-ray examinations, this work is just beginning. Greater study and experience will lead to such accuracy of diagnosis that pelvic work without a pneumoperitoneal X-ray in doubtful cases will be considered as faulty as operations upon the stomach or upper abdomen without a roentgenogram.

E. L. CORNELL, M.D.

Kellogg, F. S.: The Mortality in Placenta Prævia for the Last Twenty-Five Years at the Boston Lying-In Hospital. *Boston M. & S. J.*, 1921, clxxv, 435.

Thirteen years ago in an article regarding the treatment of placenta prævia Williams warned against rapid manual or instrumental dilatation, and advised either a Braxton-Hicks bipolar version or dilatation and the control of hæmorrhage by bags. He reported a maternal mortality of 1 to 4.85 per cent in 271 cases operated upon by fourteen different surgeons who performed a Braxton-Hicks bipolar version. The obstetricians in the author's community, however, failed to heed Williams' advice as the maternal mortality for a period of twenty years up to 1915 was as high as 20 per cent and one obstetrician advocated manual dilatation.

In five-year periods from 1895 to 1920 the maternal mortality was 17, 15, 24, 20, and 6 per cent while the number of cases for the same periods was 18, 26, 42, 66, and 66. The percentage of cases in the same five-year periods in which use was made of Braxton-Hicks bipolar version or bags was 0, 0, 2, 13, and 57 per cent. The foetal mortality has been about 48 per cent in all of the years of the series.

Various factors have entered into the improvement in the mortality record. One is that when once the diagnosis has been established, the staff cares for the case promptly and always under an anæsthetic. Another is that outside physicians do not wait for severe hæmorrhage, but send the patient in with the first symptoms of slight bleeding.

Theoretically, the Braxton-Hicks bipolar version is indicated when the child is not viable, and the use of bags is indicated when it is viable.

Pituitrin may be used in small doses in cases of floating head, fully dilated cervix, and inadequate pains, but only in the lateral and marginal varieties of placenta prævia.

It is of the utmost importance not to follow a Braxton-Hicks version with a forcible immediate extraction.

The author summarizes his conclusions briefly as follows:

"I believe we have improved our personal statistics in placenta prævia by a more frequent resort to conservative methods of delivery, specifically Braxton-Hicks version and the use of the bag, and that while other factors have contributed to our better results, this is the most important one, and that one or the other of these methods should be used to the exclusion of manual dilatation and extraction. I feel that these conservative methods of treatment are still insufficiently regarded by physicians in the community.

"I feel that we can go still further than we have gone in this regard, and that our percentage for the next five years, instead of being 57 per cent with the use of bags and Braxton-Hicks version, should be 70 or 75 per cent, since probably 20 per cent of the hospital cases get to full dilatation by the time they

are seen, and I believe that with this change there will come still further improvement in our results.

"Six per cent mortality is still too high, still higher than the old German figures with bipolar version, but compared with 20 per cent in the previous years, we may congratulate ourselves on improvement."

C. H. DAVIS, M.D.

Hirst, B. C.: The Etiology and Treatment of Eclampsia. *N. York M. J.*, 1921, cxiv, 377.

The author believes that the toxins of eclampsia have their origin chiefly in the foetal body and to a lesser degree in the placenta. The process of their conversion into excretable substances begins in the placenta, but only to a moderate extent. These substances, added to the load of a heavy protein diet, sluggishness of the bowels, and inactivity of the skin, may easily cause an overload.

The treatment of eclampsia consists of eliminative treatment, sedative treatment, measures to reduce the blood pressure, and operative treatment.

The eliminative treatment consists of diaphoresis, catharsis, gastric lavage, and colonic flushing.

In the sedative treatment morphine alone is used but is given only if the convulsions are violent and frequent.

To reduce the blood pressure an initial dose of viratrum viride and subsequently nitroglycerin are given. Venesection to the extent of 16 oz. is done if the systolic blood pressure is at or above 180 mm.

The operative treatment, cesarean section, is a last resort.

R. E. CHRISTIE, M.D.

Couvellaire, A.: Indications for Conservative Abdominal Cesarean Operation Other Than Contracted Pelvis (Indications de l'opération césarienne conservatrice par voie abdominale en dehors des rétrécissements du bassin). *Gynéc. et obst.*, 1921, iv, 358.

The results obtained by conservative abdominal cesarean section in cases of contracted pelvis justify the application of the operation under proper indications to other cases.

The author reports eighty-six cases, in forty-four of which the operation was performed before labor had begun and in the remainder during the course of labor. The principle indications for the procedure, exclusive of contracted pelvis, are the obstructions and lesions incidental and accidental to parturition. Of the obstructions the most common are uterine fibroids and the solid and cystic tumors of the ovaries. In such cases the surgeon must decide whether or not the uterus should be removed.

The conditions accidental to pregnancy which indicate cesarean section include the convulsive syndrome, utero-placental apoplexy, and cardio-pulmonary lesions. A second group are the abnormal insertions of the placenta accompanied by hæmorrhage, and a third group, the various complications of delivery. In the cases of abnormal placental implantation the author varies his treatment between cesarean section and the different types of version,

depending upon the stage of the pregnancy and the physiological function of the uterus.

Of the complications of delivery, an excessively large infant, vicious irreducible presentations, anomalies of uterine contraction, and the menace of uterine rupture constitute the most common indications.

LOYAL E. DAVIS, M. D.

Kerr, J. M.: Indications for Cæsarean Section.
Brit. M. J., 1921, ii, 516.

The principal indications considered sufficient for cæsarean section before the time of Sanger and Cameron were contracted pelvis, a very marked degree of deformity, a tumor obstructing the pelvic inlet, and eclampsia. The suggestion of Lawson Tait in 1898 that placenta prævia might be dealt with by this procedure appeared radical.

The author warns against the danger of extending the scope of the operation unduly and rashly. Pelvic deformity and fibromyoma obstructing the birth canal are definite indications. All other conditions are relative, and discrimination must be exercised in the selection of cases. The fault of cæsarean section at the present time is that it leaves the uterus permanently injured and liable to rupture at a subsequent pregnancy.

Kerr considers the indications for cæsarean section under thirteen principal heads:

Contracted pelvis. Generally speaking, unless the child is very small, a conjugata vera of 8.1 cm. calls for section. Limits of 8.7 to 7.5 cm. are conditional indications, based upon a comparative estimate of the proportions of the foetal head and pelvic inlet. Pubiotomy as a substitute in cases of contraction at the inlet is seldom adequate, but in suitable cases of contraction at the outlet, especially in the male type of pelvis, it is of considerable value.

Tumors. The tumors which most commonly obstruct parturition are fibromyoma and ovarian cystoma. When obstruction of the canal is caused by a fibroid, cæsarean section is indicated definitely as the child should not be dragged past the tumor. In such cases the foetal mortality is high, many of the children are premature, and the tumor interferes with foetal growth. Ovarian tumors rarely make section necessary. The tumor should be removed and the child delivered through the vagina.

Eclampsia. Cæsarean section is indicated in certain cases of eclampsia but its use should not be generally encouraged. It is indicated in advanced pregnancy with no dilatation, no labor, and no improvement after six hours of treatment by saline infusion, bleeding, and morphine. The foetal mortality in a series of 236 cases was 44 per cent, and the maternal mortality, 30 per cent.

Placenta prævia. In the future cæsarean section will probably be employed in the cases of primigravida with a central and vaginal variety of placenta prævia.

Accidental hæmorrhage. The difference between accidental hæmorrhage and placenta prævia is a point to be kept clearly in mind. The child's

chances are so poor that its consideration is not necessary. There is need for a more conservative method than section which would give as good or nearly as good results. Kerr believes section is required in relatively few cases of accidental hæmorrhage.

Ventrofixated uterus. Abdominal delivery is indicated in certain cases of ventrofixated uterus. Freeing of adhesions and allowing pelvic delivery was accomplished in one case.

Interposition operation. This operation always results in extreme dystocia, which usually makes cæsarean section necessary. Interposition should be put off until after the child-bearing period.

Prolapse of the cord. Abdominal delivery is indicated when this complication arises in an elderly primigravida with a rigid cervix.

Impacted shoulder presentation. This complication may be better handled by version in early cases and decapitation in late cases, as the severe types are usually of such character that the child would not survive.

Abnormal conditions. Abnormalities in the presentation of the child and a large child constitute indications for cæsarean section under special circumstances.

Retraction and contraction rings. Annular contractions of the uterus are mentioned as possible indications.

Rigid cervix and vagina. In a few cases these conditions have been the cause of sufficiently severe dystocia to warrant section. Kerr believes that in the cases of primigravida it is more often advisable to perform a cæsarean section than to allow long labor and severe lacerations and injury to both the mother and the child by the forced delivery that often is necessary.

No set rules for section are laid down. The decision should be guided by conditions and made early. Vacillation in obstetrical practice is fatal.

W. N. ROWLEY, M.D.

Holland, E.: Methods of Performing Cæsarean Section. *Brit. M. J.*, 1921, ii, 519.

Prior to Saenger's work in 1882 the uterine wound in cæsarean section had been left unsutured, but since that time his method has been generally used with unimportant modifications. The classical method has stood the test of time and its scope has been broadened with the improvements in surgical technique and the decrease in the mortality. Spiegelberg, in 1882, gave the lowest mortality as 50 per cent. The only indication at this time was pelvic obstruction. Routh's collection of cases of cæsarean section in the United Kingdom from 1891 to 1910 showed a reduction in the mortality due to better asepsis and earlier operation. Two groups were considered: early operation with intact membranes, with a mortality of 2.9 per cent in 469 cases, and late operation with ruptured membranes or vaginal manipulation, with a mortality of 17.3 per cent in 230 cases.

Kern's recent investigation of all cæsarean sections in Great Britain and Ireland from 1911 to 1920 shows a total of 4,000 cases. Operation was performed in 3,374 for pelvic contraction. The available data on 1,953 cases show that operation was done on 1,202 patients not in labor, with nineteen deaths; on 389 patients early in labor, with seven deaths; on 224 patients late in labor, with twenty-four deaths; on thirty-five patients after the induction of labor, with five deaths; and on 103 patients after attempted forceps delivery, with twenty-eight deaths. The stage of labor in the remaining 1,421 cases is not known. The mortality in the first and second groups is lower than in the cases collected by Routh, while that of the patients long in labor remains high. In late cases, especially when delivery had been attempted and operation was done for the sake of the child, the foetal mortality was high, due to cerebral hæmorrhage.

The defects in the classical operation are: (1) the risk of sepsis in infected or suspected cases, (2) rupture of the scar in subsequent pregnancy or labor, (3) possible adhesions to the intestines, and (4) adhesions between the uterine scar and omentum or abdominal wall. The author repeats in considerable detail the factors involved in the improper healing of the uterine wound as outlined by Kern in a recent article. Suture of the uterine wound must be done carefully and deliberately. Interrupted sutures through the whole thickness of the uterine wall except the decidua are best. They should begin some distance outside the edges of the incision, a well-curved needle should be used, and a wide bite of muscle should be taken. The uterine peritoneum at the time of incision should be reflected about 1.25 cm. Its closure can be accomplished by means of a running suture and over that a Lembert suture. Complete retraction before suturing is essential. The author considers silkworm gut the best suture material, silk the next best, and catgut most unsuitable.

The cervical or lower-segment operation is next considered. Recently this procedure has been revived. Its chief exponent in England is Kerr. The simple transperitoneal operation is described fully. The location of the incision low in the uterus is of advantage in the healing because of the lessened muscular activity and bleeding from the wound at this point and because suturing of the uterine walls is easier in this region, adhesions to the intestines, omentum, or abdominal wall cannot occur, the uterine wound may be covered by means of the fascia and bladder, the operation causes less disturbance of the abdominal contents, and the uterine scar is located in a much safer area for subsequent pregnancy because the lower uterine segment is not subjected to stretching until late in labor. The stretching is not active as in the scar of the classical operation. Holland states that in his future practice he will use the transperitoneal route unless the lower segment is difficult to reach or fibroids are present.

W. N. ROWLEY, M.D.

LABOR AND ITS COMPLICATIONS

Polak, J. O.: Forced Labor: Its Status in Obstetrical Teaching. *Am. J. Obst. & Gynec.*, 1921, ii, 237.

The author states that as teachers we must distinguish between what is safe for the trained specialist to do, and what is safe for us to teach our students to do.

In order to justify our endorsement of such procedures as induction, the use of prophylactic forceps, elective version, elective cæsarean section, and forced expulsion of the placenta, it must be shown that these procedures have reduced the dangers of childbirth and that the temporary relief gained from shortening the labor is not gained at the expense of greater trauma, infection, and subsequent invalidism than results from normal labor.

Further than this we must show that the occurrence of stillbirths and the deaths of infants during the first week of life are actually reduced in number. Unless this can be demonstrated, meddling with the physiological processes of labor should be discountenanced.

The introduction of the bag has increased the danger from infection, displaced the presenting parts, caused malposition, and allowed prolapse of the arm and cord.

If we are correct in our belief that there is real danger in making vaginal examinations in labor during the first stage, and if we admit that rectal examination really cuts down the dangers of contact infection and that vaginal examinations add something to the risk of infection, it is illogical to accept the insertion of a foreign body into the cervix which obstructs drainage, increases traumatism, and thus adds to the dangers of infection.

Shortening the second stage of labor by the use of pituitary extract or the routine use of prophylactic forceps with lateral dissection of the soft parts should not be taught in our medical schools.

Version cannot be considered an elective procedure in normal cases.

Elective cæsarean section is being done for constantly widening indications and undoubtedly has a place in our obstetrical armamentarium, but here again this easy method of delivery is being used too freely and without well-grounded obstetrical indications.

E. L. CORNELL, M.D.

Henrotay, J.: The Indications for Abdominal Hysterotomy During Labor, Exclusive of Contracted Pelvis (Les indications des hystérotomies abdominales pendant le travail, en dehors des angusties pelviennes). *Gynec. et obst.*, 1921, iv, 335.

Since the advent of strict aseptic operative technique, the indications for abdominal cæsarean section have become greatly increased. The conditions which may necessitate cæsarean section are: (1) the patient's general condition; (2) conditions in the uterus and vagina; (3) conditions in the uterine adnexa; and (4) conditions involving the foetus and its membranes.

Henrotay has never resorted to cesarean section in the treatment of eclampsia. In his service from 1912 to 1921 the results of expectant treatment consisting of bleeding, large doses of chloral, and hypodermoclysis compared favorably with the results of operative interference. Cardiac decompensation, nephritis with uræmia, and death of the mother are indications *par excellence* for hysterotomy.

Congenital annular stenosis or transverse partition of the vagina are not in themselves indications for operative interference. On the other hand, acquired narrowing of the vagina often necessitates delivery by abdominal section because of the lack of elasticity in the fibrous scar tissue. Stenosis, annular luetic sclerosis, and carcinoma of the cervix are all logical indications for interference. In the author's opinion the symptoms of threatened uterine rupture must be incontestable before cesarean section can be regarded as definitely indicated. Ventrofixation of the uterus is a frequent indication for cesarean section. In cases of uterine fibroma there is no harm in employing the test of labor if it is done under strict asepsis. If no result is obtained hysterotomy should be performed.

Tumors of the ovaries, either cystic or solid, may be handled in one of several ways. The tumor may be removed and labor allowed to go on spontaneously, a chance being taken with regard to the possibility of torsion of the pedicle and the tumor as well as the child being removed at one operation, or the tumor may be removed and cesarean section done at a subsequent operation.

Excessive size of the fetus as a whole or of its head, transverse presentation, and face presentation furnish indications for cesarean section, particularly if there is abnormality of the pelvis. In cases of placenta prævia the indications are dependent upon the absence of genital infection, the presence of intact membranes, and the number of hæmorrhages. Many obstetricians consider a case septic if hæmorrhage is repeated. Henrotay believes hysterotomy is indicated: (1) if the pregnancy has reached the middle of the eighth month; (2) in the presence of a grave persistent hæmorrhage; and (3) in a non-infected case. If cesarean section is performed in an infected case of placenta prævia it should be followed immediately by hysterectomy.

LOYAL E. DAVIS, M. D.

PUERPERIUM AND ITS COMPLICATIONS

Birnbaum, R.: Ligation of the Veins in Puerperal Pyæmia; a Case Cured by Ligation of the Inferior Vena Cava (Zur Venenunterbindung bei puerperaler Pyæmie; ein durch Unterbindung der Vena cava inferior geheilter Fall). *Arch. f. Gynaek.*, 1921, cxiv, 535.

Birnbaum reports the case of a woman, 31 years of age, who had an abortion during the second month of pregnancy which was followed by severe inflammation in the region of the adnexa on the left side leading to abscess formation. Opening of the ab-

cess through the rectum was followed by temporary improvement, but fever again set in and soon assumed the character of that due to pyæmia.

Alcohol therapy, intravenous injections, collargol enemata, and various intramuscular injections were tried but had no permanent effect. Bacteriological examination of the blood showed it to be sterile. As the condition gradually grew worse and the rigors became more frequent, ligation of a vein was done in the twelfth week of the illness. The abdomen was opened by a median laparotomy under chloroform-ether anæsthesia. The left adnexa were found adherent to the uterus, but the right adnexa were normal. The veins of the right pelvis were unchanged; those on the left showed extensive thrombus formation reaching into the upper part of the left common iliac vein. The left spermatic vein and the inferior vena were ligated about 5 cm. above their point of division.

The operation was well tolerated. The only noteworthy feature was a very high pulse rate which made its appearance immediately after the ligation. Birnbaum ascribes this to the markedly increased work thrown on the heart muscle by the greater resistance. There was no cyanosis or edema of the extremities. A complete cure resulted.

In connection with this case and its successful outcome the author discusses briefly the points for and against ligation of veins in puerperal pyæmia, the manner of carrying it out, and the results obtained. Different authors vary widely in their views as to the indications for the operation. The bacteriological blood findings which some surgeons have regarded as indications have been rejected as worthless by others. Birnbaum agrees with von Herff that a clear and satisfactory indication for ligation of the veins is slow, protracted bacteræmia cannot be given at the present time. The procedure can be regarded merely as an attempt to effect a cure. According to Bumm, the best results are obtained in cases of chronic pyæmia of a number of weeks' duration. In the acute form ligation has as yet shown itself powerless.

As to the technique of the operation Birnbaum states that simple ligation of the vein is sufficient to shut off the purulent thrombi from the general circulation and bring about a cure of the local process. The vein to be ligated may be the hypogastric vein, the common iliac vein, the spermatic vein, or the inferior vena cava. The ligation should be done as high up as possible and as far as possible from the disease focus.

DENCKS (Z).

NEW-BORN

Gelston, C. F.: On the Etiology of Hæmorrhagic Disease of the New-Born. *Am. J. Dis. Child.*, 1921, xxii, 351.

In the case reported it was possible to demonstrate at the time of the hæmorrhage a practical absence of prothrombin. Within eight hours after

the cessation of the hæmorrhage, prothrombin was present in normal quantities. The findings show disturbance of the prothrombin-antithrombin balance and its most remarkable re-establishment. It is in regard to the latter point, i. e., the therapy of the disease, that the mode of action of the whole blood becomes the subject of speculation.

Several possibilities are presented. There may be simply a stimulation to the production of prothrombin or the injection may supply enough prothrombin to cause cessation of the bleeding although not fully re-establishing the balance, or it may re-establish the balance. The latter hypothesis seems illogical considering the small amounts of whole blood necessary. It is more probable that a combination of the first two possibilities is involved, there being a stimulation to the production of prothrombin and also the addition of a sufficient quantity in itself to bring the constituents just within the margin compatible with approximately normal function.

The use of whole blood is now advocated in preference to that of other substances. The most advantageous site for injection is the longitudinal sinus.

R. E. CHRISTIE, M.D.

MISCELLANEOUS

Magid, M. O.: Obstetrical End-Results of the Tracheloplastic Operation. *N. York M. J.*, 1921, cxiv, 387.

The fear of performing cervical repair in women during the child-bearing period is unwarranted.

Trachelorrhaphy and cervical amputation have outlived their usefulness in gynecological surgery.

The tracheloplastic operation of Sturmdorf should be performed in all cases of chronic endocervicitis, whether the cervix is lacerated or not.

The tracheloplastic operation has no unfavorable effect on the possibility of future conception, pregnancy, or delivery.

The tracheloplastic operation in the treatment of chronic endocervicitis acts as a prophylactic measure against more serious adnexal involvement and the occurrence of cancer in the cervix.

Leonard's statistics on Emmet's trachelorrhaphy and Sim's amputation and the fact that the patients whose cases are reported have given normal birth to living children after tracheloplasty render further comment on the merits of the tracheloplastic operation unnecessary.

E. L. CORNELL, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Carelli, H. H.: **Pneumoperitoneum and an Original Method of Observing the Kidney Without Pneumoperitoneum** (Sur le pneumopéritoine et sur une méthode personnelle pour voir le rein sans pneumopéritoine). *Bull. et mém. Soc. méd. d. hôp. de Par.*, 1921, lxx, 1409.

Pneumoperitoneum permits exploration of all the organs within the peritoneal cavity. To increase the visibility of the kidney, which is outside the peritoneal cavity, Carelli produces an artificial emphysema in the surrounding cellulo-adipose tissues. This is done in the following manner:

A roentgenogram having been made with metallic landmarks on the skin, a fine platinum needle from 10 to 12 cm. long is inserted under strict asepsis as far as the transverse process of the second lumbar vertebra. When the process is reached the course of the needle is deviated so as to avoid the process. Oscillation of the manometer of the injecting apparatus indicates when the needle is embedded in the perirenal adipose tissue. The gas to produce the artificial emphysema is then injected in quantities ranging from 200 to 600 c. cm. Carbon dioxide is best for this purpose. Absorption is so rapid that if several roentgenograms are to be made they must be taken as soon as the emphysema is produced and as rapidly as possible. The slight discomfort caused by the gas disappears in less than half an hour.

W. A. BRENNAN.

MacKenzie, D. W.: **The Etiology of Renal Infections, with Special Reference to Urinary Stasis in Infections of the Renal Pelvis.** *Canadian M. Ass. J.*, 1921, xi, 714.

The power of the kidney to excrete bacteria has been recognized for many years but has not been sufficiently appreciated by clinicians. The mere physical presence of bacteria does not constitute a nephritis. A very important factor in the production of renal infections is interference with kidney drainage. This is receiving more and more consideration. If drainage is interfered with, as in kink of the ureter or sagging of the kidney, the stagnant urine affords the organisms an opportunity to multiply and grow and distention of the kidney pelvis renders the kidney tissues less resistant to infection.

Of the common mechanical predisposing causes in colon-bacillus infections of the kidney we find some of them (such as peritoneal adhesions, tumor of the pelvic organs and bowel, and pregnancy) outside the ureter, and some (such as stone, tumor, and blood clot) within the ureteral wall. Among other predisposing factors the author mentions infectious diarrhoea in infants, atrophy of the vagina in the

pyelitis of elderly women, kidney displacement, etc. A brief discussion of the paths of infection in renal tuberculosis is given.

Coccus infections of the kidney are often preceded by infection in remote parts of the body.

The author discusses the subject of colon bacillus infection in detail, especially as regards the rôle played by the predisposing factors mentioned, and urges thorough urological study of all cases of renal infection.

A complete analysis of his cases is given in a one-page table. HERMAN L. KRETSCHMER, M.D.

Graves, R. C., and Templeton, E. R.: **Combined Tumors of the Kidney.** *J. Urol.*, 1921, v, 517.

Combined renal tumors are rare. What is probably the first discussion of such growths has been recently published by Berry who also described four cases in each of which two tumors were found within one kidney.

In 1891 Beneke reported two cases of hypernephroma which presented sarcomatous characteristics. He believed in the possibility of the development of sarcoma from adrenal tissue.

The cases reported by Graves and Templeton were as follows:

CASE 1. A man 52 years of age entered the hospital complaining of hæmaturia and backache. The hæmaturia had begun one year previously and subsequently had recurred intermittently and frequently.

The routine physical examination was negative. Microscopic examination of the urine showed many white blood cells, a few red blood cells, and an occasional hyalin cast. The excretion of phenol-sulphonphthalein in two hours amounted to 60 per cent.

Cystoscopic examination revealed clear urine from the right side and very slightly blood-tinged urine from the left. A study of the output of the left kidney showed clumps of epithelial cells and occasional red blood cells. Cultures were negative. A pyelogram of the left side revealed definite distortion of the pelvic outline with a filling defect in the region of the superior major calyx.

As a diagnosis of hypernephroma was made, a left nephrectomy was performed. On the posterior surface of the kidney, just below the level of the hilus, was a small, rounded protuberance of increased vascularity. Immediate section of the organ showed it to contain two separate and distinct types of tumor. What was apparently a hypernephroma had produced the nodule described, while the upper portion of the renal pelvis was filled with a papilloma. The patient's convalescence was entirely uneventful.

In the pathologic examination it was found that the tumor mass on the posterior surface had encroached upon the pelvis considerably. It was firm, well encapsulated, and uniformly orange-yellow, and contained many small blood vessels. It extended from the level of the pelvis to 2 cm. from the capsule of the kidney below, but did not communicate with the pelvis in any portion. Below this tumor mass there was slight flattening of the pyramids. A frozen section of the cauliflower growth in the upper portion of the pelvis showed a papillary carcinoma arising from the pelvic epithelium. The tumor in the lower pole was a hypernephroma. The pathologist's diagnosis was papillary carcinoma of the renal pelvis with extension into the kidney; hypernephroma; chronic vascular nephritis.

CASE 2. A man aged 52 years entered the hospital complaining of hæmaturia which he had noted for the first time six weeks previously. Physical examination was negative.

Microscopic examination of the urine showed a few red blood corpuscles. The excretion of phenolsulphonephthalein in two hours amounted to 70 per cent. Cystoscopic examination showed the bladder and the left ureter to be normal. The right ureter allowed the insertion of a No. 5 catheter for the full distance with difficulty, and no flow of urine was obtained.

Routine X-ray studies of the urinary tract were negative. In the making of a pyelogram, 19 c. cm. of sodium bromide solution were injected into the pelvis of the right kidney. A definite dilatation was demonstrated, but the pyelogram shadow was very faint and poorly defined.

Operation was performed following a diagnosis of hydronephrosis. A pyelotomy wound permitted the escape of urine which was apparently stained with old blood. Through the defect in the pelvis bulged a soft friable tissue which was unmistakably of tumor origin. The ureter was therefore divided well below the level of dilatation and thickening and a nephrectomy was performed. The convalescence was satisfactory.

Pathologic examination of the removed kidney showed a massive papillary fungating growth occupying the greater part of the pelvis, closely following the epithelial lining of the calices, and extending 3 cm. into the ureter which it practically occluded. The main tumor was white but the tips of many of the papillary growths were quite vascular and red. Many of the calices contained dark red blood clots. The cortex of the kidney was irregular.

Section of the pelvic tumor showed closely packed, wide, papillomatous outgrowths which formed blunt villous projections into the pelvis. These villi were supported by a central cord of connective tissue in which ran a few thin-walled blood vessels.

The pathologic diagnosis was papilloma of the renal pelvis; papillary renal cystadenoma.

In each of these cases the presence of combined tumors was evident upon examination of the gross specimen. In both cases there were two separate

and distinct epithelial tumors, but in Case 1 they were both malignant while in Case 2 they were both apparently benign. In neither case did the routine physical examination reveal the presence of a tumor, although it seems that in Case 2, at least, a mass should have been palpated.

Pyelography clinched the diagnosis in both instances. In one, a filling defect was shown; in the other, a hydronephrotic dilatation, the shadow of which was faint and ill-defined.

With regard to stones and chronic infection as possible etiological factors in the development of renal pelvis tumors the authors call attention to the fact that neither calculi nor evidences of chronic pyelitis were found in these cases.

THEODORE DROZDOWITZ, M.D.

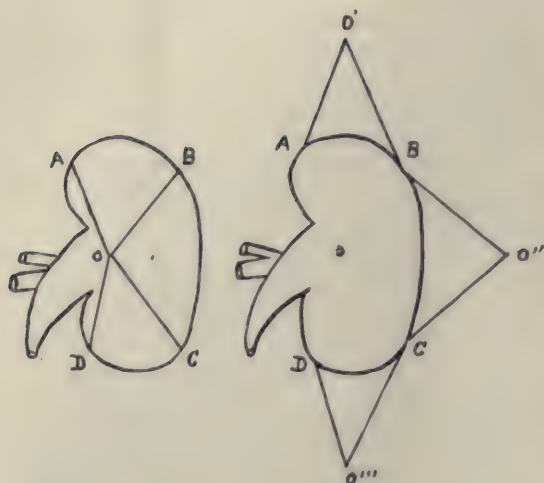
Posadas, J. N.: A New Method For Fixation of the Kidney: Hemicapsular Nephropexy (Un nuevo procedimiento para la fijación del riñón; nefropexia hemicapsular). *Semana méd.*, 1921, xxviii, 498.

In Albarran's method of kidney fixation, which is the method used most generally, the connective tissue which holds the kidney in place develops to such an extent that in some cases it may stimulate a true tumor and cause disturbances even more severe than those suffered before the operation. The compressive effects exerted on the abdominal organs cause their descent in the abdominal cavity, and the continual traction produces a renewed descent of the kidney. Posadas has observed these results in three cases operated upon by this method in which there could be no question as to the correctness of the technique as two of the operations were done in Albarran's clinic.

Posadas therefore usually prefers an orthopedic fixation although there are some cases in which resort must be had to nephropexy. For the latter he has devised a method which tends to overcome the disadvantages of Albarran's method. In this procedure only the posterior surface of the kidney is decorticated and the fixation adhesions are established in the lumbar region where the kidney rests normally. The method has given excellent immediate and end-results.

The cutaneous incision and the liberation of the kidney are the same as in every nephrotomy except that Koenig's rectilinear incision is preferred to Guyon's curvilinear incision. If the latter is used it is made further from the vertebral column to give better exposure of the lumbar musculature.

When the kidney is freed, four incisions beginning in the posterior and middle part of the renal pelvis are made on the capsule of its posterior surface. Care is taken not to injure the parenchyma. A cannulated sound is introduced beneath the capsule and the cutting is done over it. Three triangles are thus formed ABO, BOC, and COD. (See Fig.). These are carefully dissected from the apex to the base so that three triangular flaps are formed. The flaps are then sutured to the lumbar muscles at the proper height according to the Albarran technique.



The upper flap is fixed in the eleventh rib or intercostal space; the middle flap is fixed according to the size of the renal pedicle either to the deep muscles or the muscular edge of the incision; and the lower flap is fixed in the mass of the lumbar muscles. The adipose capsule is used, as in other methods, to strengthen the fixation.

W. A. BRENNAN.

Judd, E. S.: *Surgery of the Ureter. Minnesota Med.* 1921, iv, 597.

Surgical operations on the ureter are common and, as evidenced by the results at the Mayo Clinic, are carried out very satisfactorily. The close association between the ureter and peritoneum is an important guide during the operation, the ureter invariably being carried with the peritoneum when the latter is reflected. The extraperitoneal method of exposure is preferred although under unusual circumstances it may be advisable to open the peritoneum. At times the peritoneum may be accidentally opened during the exposure of the ureter; if it is carefully closed no harm will result.

Congenital anomalies of the ureter are common, but as a rule only a small number require surgical treatment. Intermittent hydronephrosis is sometimes associated with a congenital ureteral anomaly. Its exact etiology is not well understood. As a rule plastic operations for the relief of the condition are not satisfactory.

The author refers also to the rather rare condition of extravescical ureter. In such cases the urine is delivered outside the vesical sphincter or into the vagina, causing partial incontinence. Ligation or transplantation of the misplaced ureter may be done successfully.

The ureters are rarely injured by external force but such injuries are more frequent at childbirth or during the course of an operation. The latter occurrence, however, is not so common as formerly as greater care is now taken to avoid the ureters and fewer extensive hysterectomies are done. Inflammation of the ureter alone is not very common.

Usually such a condition is associated with an infection of the kidney. Independent inflammations in the ureter may occur in the form of stricture or involve a greater portion of the duct; a true stricture of the ureter is not common. In most cases in which a kidney and ureter are both diseased it may be better to leave the treatment of the ureter for a second operation. Many small ureteral stones pass spontaneously while many others may be removed by cystoscopic manipulation. Open operation is very satisfactory and should be performed when cystoscopic procedures are contra-indicated or would not be well tolerated.

Primary tumors of the ureter are rare but those secondary to papillomata of the renal pelvis are not uncommon. In all cases of papilloma of the kidney pelvis the entire ureter should be removed, although it may be necessary to do this at a second-stage operation.

In conclusion the author discusses the details of the technique of some of the operations on the ureter.

G. S. FOULDS, M.B.

BLADDER, URETHRA, AND PENIS

Boeminghaus, H.: *Extraperitonization of the Urinary Bladder (Voelcker) as a Method of Choice in Resections, Diverticula, and Total Extirpations; Five Illustrative Cases (Die Extraperitonisierung der Harnblase (Voelcker) als Methode der Wahl bei Resektionen, Divertikeln und Totalexstirpationen; fuerf einschlaegige Faelle). Deutsche Ztschr. f. Chir., 1921, clxv, 257.*

The author describes a method used successfully by Voelcker in five cases in operations on the bladder when it was particularly desirable to have the organ in full view and easy of access. Having made a transverse incision through the abdominal walls above the symphysis, he drew the peritoneum from the bladder as high up as possible without cutting it. He then opened the peritoneum and, beginning at the top, made an oval cut around the greater part of the vertex and posterior vesical wall which are covered with peritoneum. The margins of this defect in the peritoneum were drawn together with a continuous suture, and during the remainder of the operation were protected by a compress. The bladder was thus mobilized and rendered accessible from all sides.

In the same manner the operability of a tumor can be easily ascertained without opening the bladder. The employment of the method described or of the simple high section must be decided by cystoscopic examination.

In conclusion Boeminghaus recommends Praetorius's method of stopping haemorrhages from tumors by instilling into the bladder 10 c. cm. of a 20 per cent solution of collargol. KUENMELL (Z).

Grenshaw, J. L.: *Vesical Calculus. J. Am. M. Ass.,* 1921, lxxvii, 1071.

This article is based on a study of 606 cases of vesical calculus observed at the Mayo Clinic from

1907 to 1921. Fifteen tables give in detail the main facts concerning the patients' age and sex, the method of removing the calculus, the cystoscopic and roentgen-ray findings, coexistent urologic conditions and calculi, the causes, the mortality, and recurrence.

Of the 606 patients 95 per cent were males and 5 per cent were females. The youngest was 4 years of age, and the oldest, 86. The average age was 55 years. The decade of greatest incidence was between 61 and 70 (30 per cent of the cases). Between the ages of 51 and 71 the incidence was 57 per cent. Crenshaw cites the figures of other authors showing that in the United States the incidence of stone is greatly increased after the age of 50 whereas in certain other countries vesical calculus is largely a condition of childhood and early adult life.

The diagnosis was made by means of the X-ray and cystoscope. The X-ray examination was positive in 77 per cent, negative in 20 per cent, and indeterminate in 3 per cent. Cystoscopy was positive in 97 per cent, negative in 2 per cent, and indeterminate in 1 per cent. The high percentage of positive diagnoses made with the cystoscope is explained by the fact that the cystoscopist usually had the benefit of seeing the plates before making his examination. It may be said, therefore, that combined roentgen and cystoscopic diagnosis is accurate in 97 per cent of the cases.

Stone in a tuberculous bladder was found in only one case. In twenty-one cases a diverticulum of the bladder was discovered with the cystoscope, and in twelve cases at operation, making a total of 5.5 per cent of patients with diverticula which seemed to be a causative factor in the formation of stone. The incidence of diverticulum of the bladder is much greater than is usually believed, and stone in the bladder occurs in about 14 per cent of these cases.

Two hundred and twenty-eight patients had an average of 4 oz. of residual urine. In twenty-six cases the residue was questionable. The largest stone in the series measured 6.5 by 5 cm. Stones may form rapidly; in one of the cases in this series a well-defined stone was formed around a catheter head in four weeks. Of the 606 patients, 577 were operated on; 386 had single stones, 190 had multiple stones, and one had a pseudo-stone.

A severe renal colic is often forgotten by the patient, particularly if several years have elapsed between its cessation and the onset of the bladder symptoms. When a bladder stone is found the patient should be questioned in detail with regard to previous pain in the region of the kidney.

Among the causes and sources of stone are: (1) retention due to prostatic obstruction, stricture, atony, deformity of the bladder, and cystitis; (2) the kidney; (3) cystitis; (4) a foreign body; (5) diverticulum of the bladder; (6) the prostatic urethra; (7) congenital stones; and (8) pseudo-stone.

The stones were removed by suprapubic cystotomy, by lithotripsy, through the cystoscope, through the urethra, and by perineal cystotomy. The low

mortality of litholapaxy and the ease with which the operation can be performed under caudal anesthesia should tend to increase the use of this method. Its advantages more than compensate for the very slight increase in recurrence.

In 577 cases operated on the mortality was 6.23 per cent. In selected cases other operations associated with the removal of a stone do not materially increase the mortality.

The majority of recurrences could be avoided if precautions were taken to remove the cause of the original stone. X-ray and cystoscopic examination should be made after the removal of the stone in order to make sure that no fragments remain. Infected kidneys should be cleared up with pelvic lavage and the removal of foci of infection. Renal lithiasis, if present, should be removed. Cystitis should be cleared up by bladder lavage. Causes of retention should be removed. Diverticula should be obliterated if they retain urine or cause cystitis. Hygienic and dietetic measures should be instituted to improve the general health.

O. S. PROCTOR, M.D.

MISCELLANEOUS

Randall, A., Small, J. C., and Belk, W. P.: Tropical Inguinal Granuloma in the Eastern United States. *J. Urol.*, 1921, v, 539.

The authors report the results of a study of eleven cases of tropical inguinal granuloma in the eastern part of the United States. This disease has been present practically constantly in the Philadelphia General Hospital. It has been confused both here and elsewhere with other conditions, among which may be mentioned lues, chancroidal infections, tuberculosis, condyloma, and carcinoma.

Four cases studied histologically showed proliferation of fibrous tissue and enormous numbers of polymorphonuclear leucocytes and endothelial cells. The vessel walls were somewhat thickened, as in chronic inflammatory processes, and there was in every case some proliferation of the squamous epithelial cells of the skin. In some cases slight necrosis was present. Sections from two rabbits on which a necropsy was performed showed identical pictures.

When stained with Wright's or Giemsa's stain the organisms appeared as oval pink bodies with a bacillary or diplococcoid body occupying the longitudinal axis, or as small rounded pink bodies with a dark blue coccoid body in the center. The pink outer zone was a wide bacillary capsule; the dark blue central bodies represented metachromatic granules within the bacillary body proper. The true outline of the bacillary body could be seen only after the capsule had been entirely decolorized with distilled water.

The organisms were found within the cytoplasm of large mononuclear cells. In these cells they had well-defined capsules or appeared as nests of bacteria without capsules occupying a rounded area within the cell. In such nests the bipolar staining was ob-

served. The polymorphonuclear leucocytes did not contain encapsulated forms.

The granuloma organisms were grown in cultures in four instances. Surface inoculation of Sabarand's maltose agar (2 per cent acid) as recommended by Aragao and Vianna proved most successful. The acidity tended to inhibit some of the contaminating bacteria and permitted profuse growth of the granuloma bacillus. The growth was quite characteristic after twenty-four hours. Colonies appeared slightly grayish white, moist, glistening, and dome-shaped or round with a regular base from 1 to 3 mm. in diameter. When touched with an inoculating wire they appeared to be viscid. In transmitted light they were translucent. They were usually the largest colony appearing in these mixed cultures of the material taken directly from the lesions and very readily recognized. In subcultures growth occurred in all of the simpler media.

Briefly described, the organism is a non-motile, non-sporulent, encapsulated gram-negative bacillus which, with Romanowsky staining, shows metachromatic granules as well as capsules. It does not liquefy gelatin or coagulated serum and it does not form indol. It hæmolyzes blood in agar plates. It coagulates and acidifies milk within twenty-four hours. It ferments dextrose, levulose, lactose, galactose, saccharose, malatose, arabinose, mannitol, salicin, inulin, and dextrin. It does not ferment dulcitol or rice starch.

Intraperitoneal inoculation kills white mice and guinea pigs in twenty-four to forty-eight hours. The organisms are recovered at necropsy from the peritoneal fluid, the blood, and the various organs.

As a rule tropical inguinal granuloma begins as a small non-inflammatory papule which subsequently, after rupture and the exudation of slightly purulent

fluid, does not heal and exhibits a progressive tendency toward slow proliferation. The lesion is a bright-red, exuberant overgrowth of soft granulation tissue. It has absolutely no similarity to an ulcer with an eroding, undermining, necrotic base. The older lesions show at times a tendency to cicatrize at some points. Large lesions, especially those in the perineum, become bulbous, simulating condylomata acuminata.

There are few subjective symptoms. In practically all cases there is a definite degree of secondary anæmia.

All of the cases studied, with one exception, were those of negroes. The clinical diagnosis was based entirely on the bacteriological findings.

The treatment of these lesions was most disappointing until antimony was employed. Even the X-ray has not been beneficial, a recurrence having developed in at least 50 per cent of the cases in which it was used.

Following Vianna's work, antimony was given intravenously in the form of tartar emetic. Beginning with a dose of 0.04 gm. this amount was quickly increased to a maximum of 0.1 gm. The first treatments were given daily. Most of the patients tolerated this medication until about ten doses had been given.

The lesion became bacteriologically sterile after the second or third dose of the tartar emetic. Healing began within forty-eight hours after the first dose, and from then on almost daily progress was noted.

Of the eleven cases studied healing has occurred in eight. Following the advice of Vianna, the authors give all patients a course of injections after complete healing has been effected in order to prevent recurrence.

THEODORE DROZDOWITZ, M.D.

SURGERY OF THE EYE AND EAR

EYE

White, L. E.: The Etiology and Pathology of Loss of Vision from the Accessory Sinuses. *Boston M. S. J.*, 1921, clxxv, 457.

White gives the clinical and pathologic findings in a number of cases, and discusses the various theories as to the development of blindness of this type. He points out the apparent relationship between Bell's palsy of the seventh nerve and retrobulbar neuritis. Herter attributes Bell's palsy to an inflammation which, as the result of exposure to cold, has extended from a previously existing otitis media to the seventh nerve or perhaps its sheath in the fallopian canal. Reik advises examination of the ears in cases of Bell's palsy and incision of the drum membrane on the slightest indication.

White suggests that, as a result of inflammation in a posterior sinus, a similar direct extension might involve the optic nerve. He discusses also the responsibility of toxæmia, bacteræmia, and hyperplasia. The principal points in the article are summarized as follows:

1. Acute infections in the adjacent sinuses spread by continuity of structure to the sheath of the nerve, or even to the optic nerve itself, while in the more remote sinuses the infection becomes walled off.

2. If retrobulbar and optic neuritis can be caused by alcohol, lead, tobacco, quinine, optochin, ethyl-hydrocuprein, arsenic, lues, etc., there is little doubt, reasoning by analogy, that toxins originating in the accessory sinuses or, for that matter, anywhere in the body, may have a similar action on the optic nerve. Toxæmia was considered the primary factor in eight of thirty-three cases studied.

3. If bacteria are carried from a focus into various parts of the body by the blood or lymph streams, they can certainly be carried to the optic nerve from an infected sinus.

White speaks of hyperplasia as probably a secondary or predisposing factor more frequently than a primary factor because it is found so often. "Hyperplasia plus infection and direct extension to the optic nerve is of far greater importance than the mere fact that the tissue has become hyperplastic."

"Whatever may be the true explanation of the pathology, it would seem at the present time advisable to recognize the clinical fact that where no other cause for the neuritis can be discovered the opening of the accessory sinuses either by depletion or by ventilation, or by getting rid of some bacteria, generally proves beneficial. Meanwhile, any patient who has been thoroughly investigated should not be deprived of the benefits of this operation just because the bacteriology or pathology is not thoroughly understood."

THOMAS D. ALLEN, M.D.

Garraghan, E. F.: Papilloma of the Cornea. *Am. J. Ophth.*, 1921, iv, 717.

A stone cutter, 61 years of age, a moderate smoker, with no familial history of malignancy and no history of injury to the eye, noticed the appearance of a small red spot on the eyeball at the inner canthus. This tumor-like mass gradually increased in size until it covered four-fifths of the cornea. In appearance it was an extensive granular mass, raspberry like, pink, firmly attached to the sclero-corneal margin, and lying rather freely upon the eyeball. On the nasal side it was attached to a small area of the cornea.

Microscopic examination of the excised growth showed it to be a papilloma with mild secondary inflammatory reaction. The mass has recurred three times.

Epibulbar tumors originating in the cornea proper are rare. Most of the tumors involving the cornea have their origin in the sclero-corneal margin or the conjunctiva.

In the case reported the recurrence of the growth showed the tendency of such tumors to become malignant. Other cases of the kind are cited.

C. CORBIN YANCEY, M.D.

Ziegler, S. L.: Complete Discission of the Lens by the V-Shaped Method. *J. Am. M. Ass.*, 1921, lxxvii, 1100.

Discission is the operation of choice in cases of soft cataract, whether congenital, juvenile, choroidal, or traumatic, and also for the removal of the lens in high myopia. One of the chief disadvantages of discission as now practiced is that at least three, and often four or more, operations are necessary: the first, a small incision in the anterior capsule; the second, a bolder stirring up of the cortex (sometimes repeated); and the third, a posterior capsulotomy. To these may be added a possible fourth, a paracentesis for swollen cortex.

To escape all of these complications and to hasten convalescence the author performs discission by dividing the lens through and through after the technique of his V-shaped iridotomy.

This method was suggested by a study of cases of perforating wounds of the eyeball with traumatic cataract. As long as the globe remains open there is freedom from inflammatory complications, but as soon as it heals, pain, cyclitis, and ciliary swelling develop. In like manner, as long as the anterior and posterior capsular surfaces of the lens are divided and remain open, solution of the cortex progresses rapidly without pain, inflammation, or swelling, but if the anterior capsule is poorly opened or if it closes and pockets the cortex, or if the posterior capsule remains intact, the cortex begins to swell in the

angle and to press against the ciliary body, thus causing all the sequelæ which usually follow this complication. The technical details of the operation are described.

Complete dissection of the lens by a V-shaped incision has the following advantages: (1) one operation is performed instead of four; (2) expansion of the cortex anteroposteriorly relieves pressure in the ciliary angle; (3) inflammatory complications are avoided; (4) the lens cortex is rapidly dissolved; (5) convalescence is hastened; and (6) cataract glasses can be ordered in one month.

C. CORBIN YANCEY, M.D.

Francis, L. M.: The Repair of Scleral Wounds (Including Rupture) Near the Limbus. *J. Am. M. Ass.*, 1921, lxxvii, 1099.

Although in many cases closure with scleral sutures is quite sufficient, more firmness and security from infection can be gained if such wounds are reinforced by a proper conjunctival covering. The type of wounds for which the technique described is adaptable are: (1) scleral ruptures; (2) penetrating wounds of the sclera near the limbus and, if inear, parallel or nearly parallel to it; (3) prolapsing cataract wounds. The technique is as follows:

First step. Diametrically across the cornea from the wound a tongue of conjunctiva is elevated which is wide enough for scleral sutures and long enough to stretch nearly across the cornea without undue torsion. This flap, which should include subconjunctival tissue, is undermined and its length then tested.

Second step. If there is normal conjunctiva between the wound and the limbus, the surface is denuded and roughened to promote union with the flap which will later cover it.

Third step. The original wound through the conjunctiva is enlarged several millimeters on either side parallel with the limbus.

Fourth step. On the equatorial side of the wound a thick conjunctival flap is undermined which is wide enough to cover the wound and long enough to meet the flap already fashioned. If a subconjunctival rupture of the sclera is being repaired, the conjunctiva covering the rupture may be utilized in the equatorial flap.

Fifth step. Loose tags are trimmed away from the scleral wound, the edges are smoothed, and closure is effected with fine silk or linen double armed with sharp cutting needles, the sutures dipping firmly into the lips of the wound but not entirely through. Each suture is mattressed at a point where it will cover the wound when it is joined to the opposite flap from across the cornea.

Sixth step. The two flaps are united across the cornea with silk sutures. The sutures closing the scleral wound and mattressed through the equatorial flap are tied.

Both eyes are then bandaged. The sutures are removed on the fourth or fifth day. The flap will retract, leaving the wound sealed.

In cases of small wounds such as those due to a recent puncture, older fistulating wounds, and even small prolapses following cataract a flap from the opposite side is not necessary.

C. CORBIN YANCEY, M.D.

Allport, F.: Chronic Choroiditis with Liquid Vitreous and Bilateral Cataract: Operations, Good Result. *Am. J. Ophth.*, 1921, iv, 722.

The patient, a woman 60 years of age who had been under the care of an ophthalmologist for years for recurring choroiditis, iritis, and floating opacities, finally developed liquid vitreous and cataracts in both eyes. In the fall of 1920 a preliminary iridectomy in the left eye was followed by good recovery. Later an attempt was made to remove the cataractous lens but because of the escape of large quantities of the fluid vitreous it was necessary to close up the eye at once. A violent iridocyclitis followed. The patient then consulted the author who advised immediate removal of the lens. Because of the danger that a disastrous loss of vitreous might occur during transportation of the patient after the operation, she was operated upon in bed. A Fischer retractor was used instead of a speculum.

As soon as the eyeball was incised it began to collapse, the lens sinking into the vitreous chamber. It was recovered, however, and delivered by a loop. The eye was then filled with warm, sterile normal salt solution and kept bandaged for six days. At the end of that time it had healed and was normal in form; atropine and mild bichloride ointment were applied and the bandage reapplied for three days. Recovery was uneventful.

A successful preliminary iridectomy was performed upon the right eye on February 21. On March 29 removal of the cataract was attempted. This eye also slowly collapsed when incised. The anterior capsule was lacerated in an attempt to remove the lens, but without success, and the use of the loop was necessary. The postoperative care was the same as that given the left eye. Upon examination at the end of the sixth day a great deal of redness and reaction was noted. The pupil was dilated and completely filled with a white curtain. The latter proved to be the capsule. A prolonged iritis followed this operation, but the entire membrane was finally absorbed.

The ultimate result on both sides is a full, round, white, unirritated eye with a clear black pupil and vision with glasses 20/40, Jaeger No. 2.

C. CORBIN YANCEY, M.D.

Dodd, O.: Repeated Operations for Glaucoma: Report of Case. *Am. J. Ophth.*, 1921, iv, 727.

The author's patient came from a glaucomatous family, his mother being attacked at the age of 71, and his three sisters presenting symptoms of increased tension at the ages of 49, 52, and 56 years respectively.

The case reported illustrates the possibility of holding glaucoma in check by repeated operations.

The Lagrange operation, extraction of a cataract, trephining, and excision of a membrane that closed the trephine opening were resorted to in succession, each with benefit and temporary restoration of vision.

Some of the literature upon the subject is reviewed.
C. CORBIN YANCEY, M.D.

EAR

Hays, H.: The Modern Conception of Deafness and Its Treatment. *Laryngoscope*, 1921, xxxi, 673.

Hays decries the attempts to classify progressive deafness on a pathologic basis, and urges a more intensive study of the pathology of the causative factors and their effect upon the deafened ear. Such causative factors are to be found in the nose, throat, and the general system.

A proper classification of treatment is indicated as follows:

1. The elimination of the general systemic irritant, such as syphilis, rheumatism, gout, blood diatheses, and toxic processes.

2. Attention to abnormalities of the nose and throat which might give rise to chronic local inflammation.

3. The proper treatment of the nasopharynx, such as the removal of adenoids, the freeing of adhesions in the fossa of Rosenmuller, the eradication of glandular excrescences on the eustachian tubes, and the treatment of polypoid tips of the inferior turbinate.

4. The direct treatment of the ears. This necessitates differentiation of the hypertensed drum from the hypotensed or relaxed drum. In the cases of hypertensed drum the eustachian tube is mainly at fault. Treatment should be directed toward dilatating the tube by means of applicators, sounds, and bougies which can enlarge and medicate it. After dilatation, the ear may be gently inflated either by politzerization or catheterization. In cases of hypotensed drum an attempt must be made to contract the drum. In some cases this can be accomplished by the application of cantharides

collodion. Inflation of such ears will make them worse instead of better.

5. Psychological treatment. There are certain cases of advanced deafness which cannot be relieved by medical means. Such patients have been utterly neglected or mistreated. Mental reconstruction is necessary in order that they may regain sufficient confidence in themselves to become again useful members of society. This treatment should consist in: (1) advising the patient, in the most sympathetic terms, of the uselessness of attempts to relieve his trouble by medical means and that he may have a future full of promise if he will follow your advice; (2) instructing him to take up lip-reading at the earliest possible moment and informing him that this takes time and patience but that the results have proved well worth while; and (3) urging him to join an organizations attempting mental reconstruction of the deaf.

O. M. ROTT, M.D.

Dunlap, L. G.: A Radical Mastoidectomy Followed by the Formation of a False Membrana Tympani and Normal Hearing. *Laryngoscope*, 1921, xxxi, 687.

In the case reported examination disclosed a white, shiny epidermized membrane which had grown over the whole inner wall and probably rested on the stapes. To explain the normal hearing in the absence of the ossicular chain, the author suggests that it may be due to a sounding board action of the smooth mastoid cavity. The operation was performed December 19, 1919, and the patient had normal hearing March 8, 1921. O. M. ROTT, M.D.

Morsman, L. W.: Nature's Radical Mastoidectomy. *Laryngoscope*, 1921, xxxi, 691.

Morsman reports the case of a man 40 years of age who had had a chronic suppuration from the left ear since childhood. After removal of the debris and healing of the inflamed cavity, there presented the picture of a perfectly performed radical mastoid operation. The patient stated, however, that no operation had ever been performed upon his ear.

O. M. ROTT, M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Howarth, W. G.: *Mucocele and Pyocele of the Nasal Accessory Sinuses.* *Lancet*, 1921, cci, 744.

By the term "mucocele of a sinus" is meant the accumulation and retention within it of a mucous secretion due to obstruction of its outlet with thinning and possible distension of one or more of the walls of the sinus. When the contents of the cavity are purulent in character the condition is referred to as a "suppurating mucocele or pyocele."

Mucoceles are not uncommon. Many recorded as bone cysts in the region of the orbit or accessory sinuses appear to have been true mucoceles. Any of the accessory sinuses may be affected, but the author has not seen a case of mucocele of the sphenoidal or maxillary sinuses. In all of the fourteen cases reported the frontal sinus and the anterior part of the ethmoid labyrinth were involved. This seems to be the most common situation. Cases in which an abnormal air cell in the anterior end of the middle turbinate was distended with mucus were not included in the series. The thinnest wall of the portal sinus, which is the floor, usually gives way, causing a swelling in the roof of the orbit. Any of the other walls may be affected. In the ethmoid the numerous cells are usually converted into one cell by absorption of the walls.

The main clinical features of both frontal and ethmoidal mucoceles are orbital in character. A swelling is noticed at the inner and upper angle of the orbit. This may feel hard and bony or, if the walls are thin, like parchment. Sometimes it may be fluctuating.

There is no pain or tenderness upon manipulation. Pressure does not alter the size. The eyeball is usually displaced downward and outward, and sometimes forward. Diplopia may be present.

When the mucocele is purely ethmoidal the swelling may be lower down, and as it pushes forward it may involve the lachrymal apparatus. In three cases this led to a mistake in diagnosis. Epiploica may be an important early sign.

Intranasal examination is usually negative. In only two cases was anything abnormal found; in both of these nasal polypi were present.

The onset of the condition is often so gradual and its course so slow and painless that it is very difficult to assign a definite cause. It seems that for the production of the condition partial or complete blocking of the natural ostium is essential. This may be brought about by a pre-existing catarrh, as suggested by Turner. Injury as a cause was suggested by Killian.

In five of the author's cases injury was considered the exciting cause. When some of the anterior

ethmoidal cells lie unusually far forward in front of the nasofrontal duct or lachrymal bone, plastic inflammation may block the ostium or a blow near the inner canthus will readily crush the cell into the nasofrontal duct. Blocking of the natural ostium may be caused by an osteoma of the ethmoidal cells.

One of the chief characteristics of the condition is the entire absence of symptoms until an external swelling appears. The presence of ophthalmic symptoms usually leads the patient to consult an ophthalmologist. Headache may be present.

The occurrence of an acute inflammatory process in a mucocele may cause confusion in the diagnosis. Cystic dilatation of the lachrymal sac may be confused with an ethmoidal mucocele, but in the former condition firm pressure will usually express the fluid into the nose or the inner canthus.

Much more difficulty is presented by tumors of the frontal sinus and orbit, more especially osteomata and fibrosarcomata. Malignant tumors, dermoids, cysts, meningoceles, or sebaceous cysts may occur in this situation.

It is difficult to say how long the condition has lasted unless there is a history of injury. Cases are mentioned in which the duration was about twenty years, while in others a few weeks was regarded as the probable time. In the author's series there were five cases of traumatic origin. The duration in two cases was three and seven years. In the other three the average duration was about four months.

The contents of the cavity varied considerably in the different cases. It is usually a thick, glairy, opalescent, and almost gelatinous fluid. If infection has been present pus may be found.

The treatment consists in exploration through an external incision and the establishment of free intranasal drainage. The contents of the mucocele should be evacuated and as much of the bony floor of the sinus removed as necessary to form a good opening into the nose. The lining membrane should be disturbed only when it must be removed with the bony wall. A rubber drainage tube should be placed from the sinus into the nose and the external incision closed. The tube may be left in place for about ten days. When necessary, the cavity may be irrigated.

FRENCH K. HANSEL, M.D.

THROAT

Just, T. H.: *Ligature of the Carotid Vessels in Serious Tonsillar Hæmorrhage.* *Brit. M. J.*, 1921, ii, 441.

With regard to the ligation of the external or common carotid vessels in serious tonsillar hæmorrhage, Just comes to the following conclusion:

"It would seem that the correct procedure to adopt in cases of immediate, very severe hæmorrhage, uncontrollable in the tonsillar fossa, is the temporary arrest of the hæmorrhage by pressure in the fossa and the immediate cutting down on and ligation of the divided vessel in the neck. If the bleeding point be not found, it would be justifiable to compress the common, external, and internal carotid arteries in rotation in the wound to see if compression of any one of them diminished the flow from the tonsillar fossa; if so, a ligature in continuity of that vessel might temporarily diminish the bleeding so as to allow of clotting, if the bleeding came from an abnormal facial artery of moderate size. In cases of delayed or secondary hæmorrhage it would seem that ligation of the external or common carotid artery is not to be relied on and is unjustifiable."

O. M. Rorr, M.D.

MOUTH

Bloodgood, J. C.: Cancer of the Tongue: A Preventable Disease. *J. Am. M. Ass.*, 1921, lxxvii, 1381.

Bloodgood states that our aim should be not only the early recognition of cancer of the tongue, but the recognition and appropriate treatment of the benign lesions which precede cancer by months or years and the causes of these lesions—tobacco and irritating teeth.

Delay in proper treatment after the onset of the malignant lesion reduces the chances of cure in operable cases from 62 to 12 per cent, and increases the chances of postoperative death from 5 to 30 per cent. Further delay means an inoperable condition for which we have as yet no treatment promising a cure.

Educational propaganda has increased the number of operable cases seen by the surgeon from 53 to 80 per cent and has decreased the number of hopeless and inoperable cases from 47 to 20 per cent.

Men who develop cancer of the tongue have been warned by definite local lesions. There is first the

warning from a lesion that is not cancer. These precancerous lesions are leukoplakia, bad teeth, areas of irritation, ulcers, syphilitic gummata, warts, fibromata, and smoker's burns. Second, there is the warning of definite cancer developing in the precancerous lesion. This, however, may be insidious. Most uninformed persons do not seek advice until the cancer is in its advanced stage when the chances of cure are only 12 per cent and the chances of postoperative death are 30 per cent.

Improvement in the cure of cancer of the tongue is very much the same problem as that in appendicitis. Failure to cure appendicitis is not the fault of our treatment of peritonitis and abscess, but the result of our failure to instruct the public and medical profession how to recognize appendicitis before abscess formation or peritonitis develops.

After the onset of a definite cancer of the tongue in a series of cases a delay of one month caused 33 per cent to become advanced.

The condition of leukoplakia is one of the most important precancerous lesions of the mouth and should be understood by both the medical and the dental professions. It should be explained to the patient with this condition why the use of tobacco should be discontinued. He should be placed under the care of a competent dentist, directed to wash the mouth frequently with a solution of sodium bicarbonate, and required to return for repeated examinations at stated intervals until it is well established that there is no area requiring excision.

The author shows in tables the decrease in inoperable cancers of the tongue in the last decade since the public has been instructed regarding the disease and what to look for.

The message to the laity may be short and simple, but the message to the medical and dental professions must be detailed because, if their advice is sought early, physicians and dentists must be prepared to recognize the early precancerous stage or the earliest stage of cancer when the diagnosis is difficult and proper treatment is simple.

H. A. McKnight, M.D.

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GENERAL SURGERY—SURGICAL TECHNIQUE

NOTE.—The bold face figures in brackets at the right of a reference indicate the page of this issue on which an abstract of the article referred to may be found.

Operative Surgery and Technique

Is the surgeon of experience ever justified in violating the recognized surgical technique in dealing with malignant neoplasms? L. L. McARTHUR. *Surg., Gynec. & Obst.*, 1921, xxxiii, 406. [89]

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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INTERNATIONAL ABSTRACT OF SURGERY

MARCH, 1922

COLLECTIVE REVIEW

THE FUNCTION OF THE GALL-BLADDER WITH SPECIAL RELATION TO THE MELTZER-LYON TEST

WITH A REPORT OF EXPERIMENTAL STUDIES

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A STUDY of the literature on the gall-bladder shows that there are decided differences of opinion regarding certain functions of this organ, although there appears to be a general agreement regarding the following points:

1. The gall-bladder acts as a tension bulb to prevent back pressure on the liver and bile ducts. Both clinical and experimental observations have shown that the removal of the gall-bladder is followed by a dilatation and thickening of the extra hepatic bile ducts with a later relaxation of the sphincter of Oddi resulting in a continuous flow of bile into the duodenum (1).

2. The gall-bladder is a reservoir for the partial storage of bile. The normal gall-bladder is at all times found to be full of bile, for the relation of the fundus of the gall-bladder to the cystic duct makes it a physical reservoir, the latter being normally higher than the highest portion of the fundus of the bladder. Moreover, it has been shown that the gall-bladder walls have the power of extracting water and inorganic salts from the liver bile (2), thereby making the concentration of organic elements in the gall-bladder bile from six to ten times stronger than in the bile of the common duct. Thus the usual contents of the gall-bladder are equivalent to from 240 to 400 cubic centimeters of common duct bile.

During the periods of digestion, which total approximately ten hours a day, the bile is not

stored but is secreted into the duodenum. During the remaining fourteen hours of the day the bile is being stored. As it has been found that the average secretion of bile is 30 cubic centimeters per hour, a total of 420 cubic centimeters of bile is secreted in the intervals between digestion, all of which, by the power of the gall-bladder to extract fluids and inorganic salts, can be stored.

3. The epithelium of the gall-bladder mucosa secretes mucus more abundantly in proportion to surface area than any other mucus-secreting cells. The mucus lubricates the ducts and at the same time reduces the irritation of the pancreas and duodenum by the alkaline bile. It also aids in maintaining the normal bile reactions by forming a chemical compound with the bile.

4. The gall-bladder has been found to secrete a hormone (2, 11), believed by some to be secretin, which in turn stimulates the gastric secretion, of hydrochloric acid. This hormone is found in larger quantities during the height of digestion, when the flow of bile is greatest.

The probability of the existence of such a secretion is borne out by the fact that in from 70 to 80 per cent of cases after cholecystectomy there is a lowering of free hydrochloric acid in the stomach during digestion and in some cases this reduction is so marked as to produce achylia gastrica.

5. The gall-bladder, with the aid of the sphincter of Oddi (8, 9), converts a continuous secretion of bile by the liver into an intermittent flow of bile into the duodenum, and also produces a constant pressure flow of bile into the duodenum by its regulation and maintenance of a uniform pressure of bile within the extra hepatic ducts.

6. The gall-bladder can be used as a very valuable anastomosis between the liver and intestines in cases of malignancy at the head of the pancreas, cases of chronic obstruction due to stricture, and cases of stones, or it may be utilized as a means of obtaining exterior drainage.

The theory held by some that the gall-bladder is a rudimentary organ similar to the appendix is contradicted by the fact that it is present in all carnivorous animals; it is developed before the urinary bladder; it is entirely developed before the liver begins to function; and throughout embryonic and adult life it retains the same relative form. If it is removed in adult life the cystic and common ducts attempt to compensate for its loss by dilating outside the liver and duodenal walls, these attempts to restore its function sometimes extending even so far as the formation of rudimentary gall-bladders from the stump of the cystic duct.

In view of such evidences of activity on the part of the gall-bladder it seems unjustifiable to consider it a rudimentary, non-essential organ.

Since the gall-bladder is the seat of the greatest number of disturbances arising in the biliary system, and since embryologically, anatomically, physiologically, pathologically, and symptomologically, diseases of the gall-bladder are associated with diseases of the duodenum, stomach, and pancreas, an accurate method of differential diagnosis in this field is exceedingly important.

At this point, before taking up further studies, a brief consideration of the bile itself may help to clarify the discussion to follow.

Bile is being constantly secreted by the liver but varies in color, concentration, constituents, and consistency with the diet and with the amount and constituents of the blood flow through the liver. The amount of bile secreted is decreased by hunger, hæmorrhage, and anæmia, and is increased by food intake, chologogues, fats, etc. (10, 12, 13).

In healthy individuals under normal conditions the bile is retained in the extra-hepatic biliary system until food is taken into the stomach. After the ingestion of food, the bile is ejected into the duodenum through intricate physiological

processes. The height of the flow of bile coincides approximately with the height of digestion. Under normal conditions when there is no food in the stomach, no bile is found in the duodenal contents; the latter are opaque, viscid, alkaline, and fluid, and contain occasional flocculi.

The retention of bile in the extra hepatic biliary system is dependent in great part upon the action of the sphincter of Oddi (8, 9), which is situated in the ampulla of Vater and, in turn, is under the control of the nervous system. As pointed out by Meltzer (7, 14), there is a mechanism of "contrary nervous innervation" between the gall-bladder and the sphincter of Oddi. Therefore it is believed that when the sphincter relaxes the gall-bladder contracts and vice versa.

This sphincter muscle is histologically similar in animals with or without a gall-bladder (8, 9) and is always found in carnivorous animals. Its tonicity is normally equivalent to 220 to 240 millimeters of water, but in some cases, after the removal of the gall-bladder and before the relaxation of the sphincter, it reaches the height of 600 millimeters of water, while in animals without a gall-bladder it is equivalent to only from 30 to 70 millimeters of water. Thus it may be seen that in animals with gall-bladders the sphincter of Oddi has an important rôle and any disturbance in its normal function will readily cause disturbances in the remainder of the system.

In experiments performed by Meltzer (14) it was noted that a 25 per cent solution of magnesium sulphate lavaged upon the ampulla of Vater caused a relaxation of the sphincter and a subsequent flow of bile into the duodenum. Lyon (19, 20, 21, 22, 23), who carried these experiments still further, interpreted the variations in three types of bile obtained from the duodenum by means of the Rehfuß tube as due to their three points of origin, i. e., the common duct, the gall-bladder, and the liver, and on the basis of these three distinct types he formulated a method for diagnostic and therapeutic use in infections of the biliary system.

In order to obtain a clearer understanding of the mechanism of Lyon's test a series of experiments were performed in the Lakeside Pathological Laboratories in collaboration with Dr. H. Goldblatt with the technique described by Lyon (19) and modified by Brown (24). These experiments were carried out as follows:

Six large healthy dogs were well fed on a mixed diet, kept in large well-lighted rooms, and given daily exercise. Twelve hours after the last meal a specially prepared bit was placed in the dog's

mouth. In the center of this was a hole through which a duodenal tube could be passed. With proper observation of the precautions mentioned by Brown (24), the tube was passed into the stomach. After a while the dog could be trained to lie on his right side during the tests which were made at fifteen-minute intervals for a period varying from one-half to four hours. When the tube was found to be in the duodenum, as determined by the alkalinity of the fluid, the duodenal tug on the tube, the length of the tube which had been passed, and the fluoroscopic examination made according to the method of Brown (24) and Lyon (19), the following observations were made:

1. Repeated tests showed that the sphincter relaxes in response to stimulation by acid meat extract, stomach chyme from another dog, a 25 per cent solution of magnesium sulphate, and persistent traumata, as well as to normal physiological stimulation with 0.5 per cent hydrochloric acid. The sphincter does not respond to water, egg white, starch, or alkaline fluids. During these tests no bile was found in the duodenum at the end of a sixteen-hour fast.

2. Tests made upon dogs which had fasted for sixteen hours showed definitely that the injection of 15 cubic centimeters of a 25 per cent solution of magnesium sulphate produced the three differentiated phases of bile described by Lyon, and that the injections could be repeated at intervals of from forty to sixty minutes with the reproduction of the three phases each time for a maximum of four times. At the last the distinction between the three phases became more gradual and less clearly defined. However, if the tests were repeated at thirty-minute intervals, a satisfactory result could not be obtained after the second test.

3. In two dogs the abdomen was opened under local anaesthesia in order that observations might be made upon the intact gall-bladder. At no time preceding or during the test was the gall-bladder found to be empty and at no time did it contract forcibly in attempting to empty its contents. The only movement noted was a slight collapse of the fundus followed by a minute wave of contraction which ended by producing a fullness about the opening of the cystic duct which was succeeded by a fullness of the duct itself.

As the contractile force of the gall-bladder is only from 10 to 30 millimeters of water higher than the pressure of the common duct bile which is 220 to 270 millimeters of water, one can hardly expect the gall-bladder to contract very

forcibly. During digestion, however, it has been found to have very weak, irregular contractions which occur at intervals varying from three to five minutes.

4. In one instance, after a satisfactory normal test had been made and the duodenal tube had been found in proper position as ascertained by the character and the reaction of its contents and by fluoroscopic examination under local anaesthesia, the duodenum was exposed and opened so that the ampulla of Vater could be viewed transduodenally. Fifteen cubic centimeters of a 25 per cent solution of magnesium sulphate were then injected through the duodenal tube. Shortly after the injection it was noted that the peristaltic contractions of the duodenum seemed to be less active, and when the ampulla was viewed, a flow of bile was seen to mix with the duodenal contents which, aside from being slightly blood tinged, had previously consisted of an almost clear mixture of duodenal contents and magnesium sulphate. Part of the bile flow that continued was seen to be collected in the tube by the suction of the tube aided by the movements of the duodenum. Some of the duodenal contents, however, were carried down into the jejunum by the peristaltic movements.

The changes in the color of the bile flowing out of the ampulla could be seen to a certain extent, but the differences in coloring were more clearly shown by specimens collected from the end of the Rehfuß tube.

After the test was completed the tube was moved below the ampulla and a similar injection was made but no results were obtained. When the tube was pulled above the ampulla another injection of 15 cubic centimeters of the magnesium sulphate solution was followed by a flow of bile from the ampulla but the bile could not be collected because the tube was above the source of flow. In the light of this finding it seems reasonable to infer that the test, when performed upon a patient, might give a result which would be open to incorrect interpretation. Just as was the case in animal experimentation, the collecting tube might be improperly placed in relation to the flow of bile and no bile might be collected even though agents suitable for relaxing the sphincter were brought into contact with it.

5. Cholecystostomy with drainage was performed in two instances. In both cases a previously satisfactory control test had been obtained. Upon passage of the tube the following day in a fasting animal bile was found in the duodenum. Fifteen cubic centimeters of a 25 per cent solution of magnesium sulphate were

then injected with the resulting increase in the flow of bile from the end of the tube. Little change in the color of the constituents was noted and a three-phase test was not obtained. Further studies on these animals were prevented by the occurrence of infection.

6. After satisfactory normal controls had been secured repeated tests in one cholecystectomized dog showed the absence of the so-called gall-bladder phase.

7. In all of the experiments described the flow of bile from the end of the Rehfuß tube was intermittent, showing a definite relationship to the respiratory movements. As pointed out by Verdin, the pressure in the gall-bladder and cystic ducts increases during inspiration and decreases during expiration. This fluctuation in pressure is due to the change in intra-abdominal pressure during the respiratory movements and the change in the position of the liver, which produce a so-called suction-bulb action in the gall-bladder (8).

8. During these experiments it was noted that the duration of the relaxation of the sphincter of Oddi varied, being dependent in part on the nervous state of the animal. In two instances in which the dog was suddenly frightened during the test the flow of bile ceased but later reappeared. Under normal conditions the relaxation lasted from fifteen to thirty minutes. However, in two instances the tests were carried out while the animal was asleep and in each case a flow of bile was obtained for one and one-quarter hours from a duodenum which had previously been bile free.

9. In every test, even after the most thorough precautions, flocculi could be found in the clear duodenal content or in the different phases of the test. These flocculi were usually most abundant during the so-called liver-bile phase and were composed of a mucoid substance and white blood cells. At times bacteria were found. Cultures were not made from the different specimens as the experiments were being made on normal animals.

10. As an introductory method of draining the extra hepatic biliary system the sphincter of Oddi was cut. The purpose was to determine the effect of continued drainage upon the gall-bladder and the power of regeneration of the sphincter in a normal as well as in an infected gall-bladder. A report of the findings will be made at a later date.

From the literature and the experiments reported herewith the following deductions may be drawn:

1. The gall-bladder has a distinct function and its removal results in changes in the extra-hepatic biliary system which not only impair its function, but also result in disturbances of the function of adjoining organs.

2. The sphincter of Oddi plays the most important part in the regulation of the function of the extra hepatic biliary system. Certain chemical and physical stimuli will cause it to relax, and when the sphincter has once been relaxed the duration of relaxation varies with the nervous state of the animal.

3. That the gall-bladder does not contract and empty itself following relaxation of the sphincter of Oddi is shown by the following findings:

(a) The test can be repeated at least four times at frequent intervals.

(b) At no time was the gall-bladder found empty or seen to empty itself.

(c) The difference in pressure between the gall-bladder and the cystic duct—only 10 to 30 millimeters of water—is insufficient to cause a forceful contraction.

(d) The intermittent flow of bile from the gall-bladder bears a relation to the respiratory movements and is not definitely connected with the contraction of the gall-bladder.

(e) If the gall-bladder is filled with methyl blue and the bile is observed during digestion, no blue stain is noted in the bile except when the gall-bladder is mechanically pressed (31).

4. Eighty-five per cent of the infections in the gall-bladder are primarily in the gall-bladder wall and are hæmatogenous in origin (27). The presence of infection in the mucosa and bile does not occur until later and is believed by some to be an indication of an end-process as in 60 per cent of cases of cholelithiasis the gall-bladder bile is sterile but the walls show an old chronic inflammatory process. This finding suggests the following queries: If drainage is attempted after the infection has reached the gall-bladder bile and even after stones have been found, would not the stones block the cystic or common duct if the gall-bladder contracted? Or if drainage was accomplished, what effect would be produced upon the already badly damaged gall-bladder wall? Granting that drainage of the gall-bladder can be effected, why do we not get gall-stone colic as a result of the contraction of the gall-bladder following the test or why do we not get infection in the common duct with resulting complete obstruction? The infection cannot be drained out of the gall-bladder wall, and drainage of the gall-bladder itself does not prevent the continua-

tion of the infectious process in the wall and the adjoining tissues.

5. The specimen termed gall-bladder bile would appear to be the result of gravity, the secretory pressure of the liver, and the vesicular pressure which is increased by the respiratory movements.

6. With even the most careful precautions, flocculi are obtained in both man and animals. These flocculi are made up of mucus, white blood cells, and occasional bacteria. The liver is known to be a system filter for bacteria. It would appear, therefore, that sterilization of the stomach and duodenum is impractical. If pathogenic bacteria are isolated, do they necessarily have to come from the gall-bladder? As the gall-bladder infection is primarily hæmatogenous in origin and a manifestation of general systemic infection, why could not the pathogenic organism be filtered through the liver from the blood? If the gall-bladder is primarily infected in its walls this infection is not accessible to drainage.

7. Cholecystectomized animals do not give the so-called gall-bladder phase of the test.

8. The normal duodenum is free from bile during the fasting state.

No light has been thrown by these studies upon the following interesting points:

1. The significance of cholesterol crystals found in normal gall-bladders.

2. The effects of continuous drainage upon the gall-bladder (extra hepatic biliary system and general system) by means of sectioning the ampulla.

3. The action involved in the relaxation of the sphincter of Oddi.

4. Exact data for the correct interpretation of the three phases of the Lyon test.

5. The action of magnesium sulphate. Is this due to the formation of acid salt, the magnesium ion, or the sulphate ion?

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

ANÆSTHESIA

Labat, G. L.: The Latest Achievements of the Art of Local, Regional, and Spinal Anæsthesia.
Ann. Surg., 1921, lxxiv, 673.

Cathelin, in 1901, attempted epidural, sacral, or caudal anæsthesia, a method which Lawen placed on a practical footing in 1910. Danis, in 1913, described a method whereby the sacral nerves were reached through the posterior sacral foramina. These procedures may be used separately or combined to establish what is called "sacral block."

If caudal injection alone is done, 30 c.cm. of a 2 per cent solution of novocaine containing 10 drops of adrenalin (1:1,000) should be used. The anæsthesia appears within thirty or forty minutes and results only in analgesia. The method is satisfactory for hæmorrhoidectomy, perineorrhaphy, cystoscopy including fulguration, and radium treatment of the carcinomatous prostate. It is not always reliable for prostatectomy.

Transsacral anæsthesia is obtained by injecting from 2 to 10 c.cm. of a 1 per cent solution close to the nerves as they emerge from the sacral canal. The anæsthesia appears almost immediately and lasts from two to three hours. It is indicated for all operations on the anus, perineum, vagina, prostate, bladder, urethra, and penis. When combined with caudal anæsthesia it is considered the method of choice for the Kraske operation.

In the majority of cases a single dose of 1/6 gr. of morphine and .03 gr. of scopolamine given an hour before the anæsthesia controls the psychic condition satisfactorily. Narcotics intensify and increase the duration of local, regional, and spinal anæsthesia. Education of the patient by the doctor and nurse before the operation is an important factor in the success of the method.

Novocaine, the anæsthetic of choice, should be freshly prepared as part of its anæsthetic property is lost when it is boiled repeatedly. Novocaine hydrochloride in powder can be sterilized by autoclaving; its melting point is 153 degrees C. Fresh solutions, prepared by dissolving sterile novocaine in cold sterile normal salt solution, are more active. Since Goetsch's adrenalin sensitization test for goiter with exophthalmic symptoms first appeared, the author has used pure novocaine solutions for paravertebral injections preparatory to thyroidectomy in cases of exophthalmic goiter.

In 1913, Kappis determined from extensive experiments on dogs that all organs below the cæcum are supplied by lumbar sacral nerves and

that sectioning of the splanchnic nerves produces anæsthesia of the stomach, the spleen, and the upper part of the small intestine. In 1919, he concluded further that the first three lumbar nerves send rami communicantes to the retroperitoneal ganglion and therefore take part in the transmission of pain from the upper abdominal organs below the sigmoid colon whose sensory innervation goes through the hypogastric plexus to the rectum and the urogenital apparatus. On the basis of these findings anæsthesia of the splanchnic nerves of the rami communicantes was attempted by a posterior route of approach, a method which, in the hands of Kappis, Naegeli, Hoffman, and the author, has given satisfactory results.

The author's technique for inducing spinal anæsthesia is briefly as follows:

The patient is seated upright and the puncture made at any level between the twelfth dorsal and the fifth lumbar vertebræ, depending on the height of the anæsthesia desired. The first few drops of cerebrospinal fluid are allowed to flow out in order to obtain a clear fluid. The clear fluid is allowed to fall into a special ampule containing the anæsthetic drug. Between 10 and 25 c.cm. of fluid are withdrawn, depending on the condition of the intraspinal pressure, and the solution is aspirated into a syringe. The syringe is attached to the spinal puncture needle and an amount of new fluid equal to that it already contains is brought into it. Half of this is injected very slowly, more new fluid is aspirated, the syringe is discharged in the same way, leaving less and less fluid in it, and at the end of four or five injections it is emptied. The patient is then placed in a recumbent position while the operative field is prepared. No post-anæsthetic headache, nausea, or vomiting has been observed in more than 100 cases of spinal anæsthesia in the Mayo Clinic.

A. C. JOHNSON, M.D.

Santy, P., and Bizot, D.: Regional Anæsthesia in Operations on the Thyroid (L'anesthésie régionale dans les opérations sur le corps thyroïde).
Rev. de chir., Par., 1921, xl, 546.

The authors state that the thyroid region lends itself admirably to the technique of local anæsthesia because the spinal nerves can be reached at their origin easily and the underlying tissues of the region are only weakly sensitive after the skin has been incised.

The method used by the authors is very simple and rapid. The patient is put in horizontal decubitus and the operator stands at his head facing in

the direction of the vertebral axis. Bilateral anaesthesia is essential. The anterior cervical masses on one side are kept pushed back by the fingers of the left hand until the projection of the vertebral transverse process is clearly outlined. The finger will easily feel the pulsation of the carotid artery. Anaesthesia of the skin is induced by injecting a few drops of solution about 1 cm. beneath the mastoid apex on the line formed by the crests of the transverse processes.

For the deep anaesthesia an 8-cm. needle is inserted at the same point, perpendicularly to the axis of the neck, and then pushed in front of the mass of the apophyses so that it reaches a point in front of the second cervical vertebra. When it comes in contact with this process it is withdrawn for 2 cm. and embedded again, its point being directed toward the anterior surface of the transverse process of the first cervical vertebra. Four or five cubic centimeters of novocaine-adrenalin solution are then injected, the degree of penetration of the needle being constantly varied to extend the zone of infiltration. The first injection having been

completed, the zones of the second, third, and fourth transverse processes are also anaesthetized. The same procedure is repeated on the other side, about 30 or 40 c.cm. of solution being used.

All four transverse processes can be anaesthetized without withdrawing the needle from its first insertion if it is partly withdrawn and its direction and depth of insertion are changed. If the needle passes behind the brachial plexus there is no danger. The authors have used this procedure for anaesthesia of the anterior part of the neck in a large number of cases with complete success.

An illustrative case cited was that of a woman 72 years of age who had a large goiter on the right side which had caused pressure necrosis of the trachea and crises of dyspnoea. In another case regional anaesthesia of the brachial plexus and of the cervical plexus on both sides was induced to allow approach to the oesophagus at its entrance into the thorax and exploration of the recurrent nerve. The whole region between the lower maxilla and the clavicles was anaesthetized.

W. A. BRENNAN.

SURGERY OF THE HEAD AND NECK

HEAD

Alamartine, H.: Early Decompressive Trephination and Closed Cranio-Encephalic Injuries (*Trépanation décompressive précoce et traumatismes cranio-encéphaliques fermés.*) *Lyon chirurg.*, 1921, xviii, 606.

Alamartine discusses the views expressed at a recent meeting of the Société de Chirurgie at Paris regarding Cushing's early decompressive trephination in cases of closed cranial injuries with serious complications.

He states that lumbar puncture does not always cause cerebral decompression when there is intracranial hypertension, and that in cases of hypotension it may have just the opposite effect. As a decompressive operation it is far less efficacious than Cushing's procedure.

Cushing's operation is essentially a decompression operation. It is not indicated by the fracture but by the intracranial lesions. However, on certain intracranial lesions—notably, extensive areas of superficial and deep contusion of the brain, bulbo-protuberantial hæmorrhages and, very probably, meningeal infections—it has no effect.

While we may reject Cushing's suggestion to perform a decompressive trephination in all cases of fracture of the base of the skull, it is indicated whenever there is a clear syndrome of intracranial hypertension and lumbar puncture demonstrates the presence of blood in the cerebrospinal fluid. All surgeons who have performed it recommend it. In many cases it has disclosed lesions which the clinical examination did not suggest.

Of nineteen cases of injuries of the skull and brain nine were treated by ordinary methods such as the

application of ice to the head, aseptic treatment of the wound, and lumbar puncture. Two of the patients arrived at the hospital in a dying condition and died after a few hours without any operation. Six patients were operated upon. Two of these died and four recovered. In one case death was caused by extensive bulbo-protuberantial hæmorrhage and in the other by meningitis due to an ethmoidal fissure, conditions which could not be relieved by the operation. In the four cases ending in recovery lumbar puncture showed blood in the cerebrospinal fluid and there were intracranial lesions of a type known to be affected favorably by decompressive trephination.

W. A. BRENNAN.

Lenormant, C.: Considerations Regarding Epilepsy Following Injuries of the Skull and Its Treatment (*Quelques considérations sur l'épilepsie consécutive aux traumatismes du crâne, et son traitement.*) *J. de chir.*, 1921, xviii, 577.

The enormous number and the severity of cranial wounds which occurred during the world war have given the subject of traumatic epilepsy a new interest.

The considerable divergence of statistics quoted to show the percentage of cases of epilepsy following skull wounds is due to the source of the cases, the time of observation following the injury, and the thoroughness with which cases were followed after the first examination. The statistics gathered from the service of Marie rose from 5 per cent in 1916 to 12.1 per cent in 1919.

The anatomical location of the lesion exerts a certain influence upon the frequency of epilepsy. While this complication follows injuries in the parietal region more commonly, the author has had

numerous cases in which it developed after injuries in the frontal or occipital areas over the so-called "silent" zones. The severity and extent of the lesion have no direct relation to the frequency or gravity of the seizures. In fact, large destructive lesions of the brain are more often associated with paralytic phenomena than with convulsions.

The most important factor in the prophylaxis of traumatic epilepsy is the complete and efficient primary treatment of the craniocerebral wound. It is the constant presence of definite anatomical and physiological lesions which indicates the surgical treatment of traumatic epilepsy. These lesions involve the bone, meninges, and cerebral cortex. Injuries of the bony covering of the brain may cause depressions of one or both tables of the skull, the presence of free splinters of bone in the cranial cavity, a complete loss of bony substance, or a fistula due to cranial osteomyelitis.

Following infected wounds of the head the meninges may become very thick and fibrous and the meningeal cicatrix may exert compression or traction upon the underlying cerebral cortex. Calcareous deposits in this scar may result in a true pachymeningitis ossificans. Frequently cysts develop from the meninges, which contain a clear, yellowish, and at times sero-hæmorrhagic fluid. The cavities of these cysts do not communicate with the subarachnoid space. Not infrequently a localized arachnoid oedema causes pressure upon the pial vessels and the underlying cerebral cortex.

Cysts of the cerebral cortex are somewhat less common than meningeal cysts. When they follow closed cranial fractures or occur in infants they are extraordinarily large and may communicate with a lateral ventricle. As a rule they contain disintegrated cerebral tissue and cerebral fluid mixed with blood. On the other hand, small encysted hæmorrhages surrounded by an area of softening may be present and may give rise to a latent cerebral abscess. The possibility of cerebral injury by contre-coup and the occurrence of epileptic seizures upon the same side as the cranial lesion must not be overlooked. In many cases of traumatic epilepsy no macroscopic lesions may be found but histologic examination of the brain shows diffuse microscopic alterations in the white and gray cortical substance. The latter may be neuroglial scleroses, small disseminated hæmorrhages, and chromatolysis of the pyramidal cells. In these instances search for the epileptic center is futile and a decompression to reduce cranial hypertension is all that can be accomplished. Persistent epileptic crises constitute a direct indication for surgical treatment and operation should not be delayed until the epileptic state, a relative contra-indication, develops.

The site of cranial exposure will be determined by the visible traces of the causal traumatism. These are particularly significant when the condition occurs after injury over "silent" areas. However, in many instances no traces of the original injury

are left and reliance must be placed entirely on the character and location of the seizures.

After exposure of the area the bony spicules should be curetted away, the irregular edges of the bone smoothed off, or the depressed fragment raised. Search for free bony splinters should always be done very delicately. Superficial or deep foreign bodies located by the X-ray should be sought for with an equally delicate technique. Deep particles should usually be left alone as they rarely produce epileptic crises and their removal entails the destruction of considerable brain tissue. Meningeal cicatrices must be separated carefully. Small meningeal cysts should be completely removed. More difficulty is experienced in the total extirpation of intracerebral cysts as usually they are intimately adherent to the surrounding cortex. In such cases the possibility that the cyst may communicate with a lateral ventricle must be borne in mind. Abscess cavities may be opened and drained successfully. Scarification of the pial vessels and of the cortex has been attempted when the only pathology demonstrable was an oedema of the arachnoid.

Excision of the epileptic center after cortical stimulation and recognition of the involved area is usually followed by the cessation of the convulsions. Transitory paralysis may follow but usually disappears in time. Section of the subcortical connections of the epileptic center, while entirely successful in animals, has not been of the same value in man. This is true also of massage of the involved cortical area.

The various and diverse procedures directed toward the repair of dural defects in these cases have not isolated the brain and meninges effectively or prevented the reproduction of cicatricial tissue. Materials used for this purpose have included periosteum, muscle, hernial sac, fascia, fat, and dermal transplants. Repair of the skull defect in cranial wounds followed by epileptic seizures is absolutely contra-indicated, but several cases have been reported in which improvement followed active cerebral radiotherapy. In the author's opinion favorable results are obtained by surgical treatment of traumatic epilepsy in 60 per cent of the cases.

LOYAL E. DAVIS, M.D.

Adson, A. W.: The Treatment of Brain Tumors.
Surg. Clin. N. Am., 1921, 1, 1343.

The author makes a special appeal for the early diagnosis of brain tumors, fewer palliative operations, and more radical surgery. A brief review is given of the pathology of brain tumors and attention is directed to the operable lesions.

The groups of symptoms for the various locations of tumors are not outlined, but the importance of those produced by intracranial pressure, headache, choked disk, and projectile vomiting is emphasized. When these three symptoms, or any two of them, are present, or only choked disk is noted, the patient should be given the benefit of a thorough neurological examination and should not be treated as for a

gastric complaint or as an individual with ordinary refractive disturbance. If evidence of intracranial pressure is demonstrable, a differential diagnosis is necessary to determine whether the lesion is of inflammatory or neoplastic origin. For this purpose the services of a competent neurologist are necessary, and if a diagnosis of brain tumor is made, every means possible must be employed to determine the location and consistency of the growth. If the tumor is operable, it should be removed radically; if inoperable, such as a diffuse infiltrating glioma of rapid onset, the advisability of surgical interference is questionable.

Although radium has a destructive action on brain tumors, its exact effect has not been determined. It is probable that it will be a valuable adjunct in the treatment of inoperable tumors, in the prevention of recurrence of tumors after intracapsular removal, and in the retardation of the growth of partially removed tumors. Apparently better results are obtained by the use of radium in the destruction of endothelial growths than of gliomatous growths. A definite statement with regard to the dosage cannot be made at present, but the author believes that large doses, more than 1,000 mg.-hrs. at a time, are indicated, and that the implantation of radium is more effective than its external application. However, in some cases repeated external applications at intervals of two to three months are beneficial.

In mild cases of intracranial pressure due to tumor decompressions give relief from the headache within a few days, but in severe cases the relief is less complete. The patient with mild symptoms will be relieved for from six to eighteen months.

Following the successful removal of a brain tumor relief is soon obtained from symptoms of headache, choked disk, and vomiting; usually the patient is very comfortable within two or three weeks. Improvement in motor paralysis is early and continues for from six to ten months, when recovery will be either complete or the condition will remain stationary. During the convalescence, massage and passive motion should always be employed. If there have been symptoms of grand-mal epilepsy an amelioration of the severity of the attacks with a decrease in their frequency may be expected for the first two years; if by that time there is no relief, hope for complete freedom from the convulsive attacks should not be entertained. In cases of this type it is advisable to prescribe bromides postoperatively. The dosage should vary according to the case, but for adults range from 30 to 60 gr. a day. Sphenobarbital tablets, $1\frac{1}{2}$ to 3 gr. a day, may also be used.

Decompressions are indicated for patients suffering from intracranial pressure, but are of no value for those with migraine, cerebral diplegia, or idiopathic grand-mal epilepsy, or for those who have developed complete optic atrophy without localizing signs.

Exploration of the brain with an attempt at radical removal of the lesion is indicated for all

patients suffering from localized brain tumors, and should be performed in preference to simple decompression.

Doubtless radium will be a valuable adjunct in the treatment of inoperable and partially removed brain tumors.

Fischer, J.: Brain Tumor and the Ear (Hirntumor und Gehörorgan). *Monatsschr. f. Ohrenh.* 1921, IV, 371, 531.

In a great number of cases the diagnosis of brain tumor has been based on the ear findings. In cases of tumor of the cerebrum these findings gave a correct indication in 47.5 per cent of cases, but in 11 per cent they led to an erroneous diagnosis. When the growth involved the acusticus its site was correctly determined in 90 per cent. The diagnosis of tumor of the cerebellum was correct in 56 per cent and incorrect in 19 per cent.

No conclusions as to the nature of the tumor can be drawn from ear findings.

Like choked disc, the ear findings are of great importance in the early diagnosis and localization of tumors of the anterior and middle cranial fossæ. For acusticus tumors they have the significance of a localized symptom. A choked disc of the acusticus is analogous to the choked disc of the opticus. If the ear findings are progressive, they always constitute an indication for trephination to prevent deafness by removing pressure. CREITE (Z).

Linke, W.: Spontaneous Fractures of the Lower Jaw (Ueber Spontanfrakturen des Unterkiefers). *Deutsche Zahnärztl. Wchnschr.* 1921, XXIV, 362, 373, 385, 397.

The causes of spontaneous fractures of the lower jaw include inflammatory diseases of the mandible, such as osteomyelitis, tuberculosis, actinomycosis, and luetic processes. Osteomyelitis of the jaw may develop from the teeth, being secondary to diseases of the dental periosteum and its surroundings, or may be of hæmatogenous origin. Cysts of the root of a tooth seldom lead to fracture of the jaw as they destroy chiefly the marrow space of the bone, having less effect on the spongiosa and compacta.

Spontaneous fractures are often caused by tuberculosis; they may be double or multiple. Fractures of the jaw secondary to actinomycosis are rare. Osteitis syphilitica appears in two forms, circumscribed and diffuse. The destructive processes of the latter are the more severe. Spontaneous fractures due to tabes occupy a place by themselves. In such cases the brittleness of the bones is caused by trophic disturbances, osteoporosis, and the formation of necrotic areas. Other causes of fracture are mercury and phosphorus poisoning. Arsenic poisoning is less frequently responsible. By causing a loss of substance in the bone, tumors also may lead to spontaneous fracture; this is particularly true of carcinomata and sarcomata, but benign tumors, cystomata, adamantinomata, odontomata, and follicular cysts may have this effect. Spontaneous

fractures of the lower jaw due to rickets and osteomalacia have not been observed. The anatomical character of spontaneous fractures is determined by the pathologic process preceding them. They are mostly defect fractures with swelling, breaking down, carious softening, and necrosis of the bone tissue; sometimes there is simultaneous new bone formation at the site of the break.

The site of spontaneous fractures is often typical. Dental osteomyelitis frequently begins in the wisdom tooth, while the hematogenous type usually involves the ascending ramus of the mandible. Tertiary syphilitic processes are most apt to attack the angle of the jaw.

The symptoms of a spontaneous fracture are dependent on both its position and the pathologic process responsible for it. The diagnosis presents difficulties only when the break occurs in the angle of the jaw or the ascending ramus.

The prognosis as to bony union depends on the regenerative processes accompanying the pathologic process. It is unfavorable in cases of tumors, tabes, tuberculosis, chemical necrosis, osteomyelitis, and luetic osteitis. The treatment will be determined by the etiology. Malignant tumors demand extensive resection, the consequent defects being overcome by means of a prosthesis. A later osteoplastic operation can be done only in cases of benign tumors. In necrosis caused by osteomyelitis, actinomycosis, or phosphorus poisoning, sequestrectomy is to be undertaken only after extensive periosteal new bone formation. In lues, antiluetic treatment is indicated. Bone suture is impossible in any case of spontaneous fracture. After manual replacement of the fragments, fixation splints should be applied as in cases of traumatic fracture, but on account of the long continuance of the immobilization they must be of a more stable type—wire splints, slanting planes, or Schroeder's sliding splint. The last is preferable and is sometimes combined with the use of intermaxillary rubber bands. When the lower jaw is toothless, fixation may be obtained with the aid of an artificial denture.

Case histories are given.

LOEFFLER (Z).

NECK

De Gaetano, L.: Deformities of the Neck Due to Embryonic Malformations; Congenital Cysts and Fistulae (Deformità del collo per malformazioni embrionali; cisti e fistole congenite). *Arch. ital. di chir.*, 1921, iv, 265.

The author classifies congenital cysts and fistulae of the neck as follows:

I. ANATOMICO-CLINICAL CLASSIFICATION

1. Suprahyoid, or arising from the floor of the mouth. These have their origin in the space between the hyoid bone and the floor of the mouth.

2. Thyrohyoid (subhyoid and suprathyroid). These arise in the space between the thyroid and the hyoid bone.

3. Thyroid. These have their origin at the level of the thyroid.

4. Subthyroid (suprasternal or jugular). These develop from the thyroid and sternum.

2. ANATOMICO-HISTOLOGIC CLASSIFICATION

1. Branchial (lateral): rarely median with a tendency toward lateral deviation.

a. With ectodermic epithelium (dermoid cysts). Such cysts, like all dermoids, may develop from invaginated ectoderm and do not necessarily have a branchial origin.

b. With endodermic epithelium (mucoïd cysts) rich in lymphatic tissue: cylindrical epithelium (embryonic pharyngeal type); polystratified epithelium (adult pharyngeal type).

c. With mixed ectodermic and endodermic cylindrical or polystratified epithelium.

2. From the thyroglossal tract (median): with cylindrical epithelium or vibratile cylinders and thyroid nests at the periphery (from the median lobe of the thyroid).

3. From the thyropharyngeal duct (lateral and median).

a. Thyroid, with embryonic or adult thyroid epithelium (from lateral lobes of thyroid).

b. Parathyroid (from the parathyroids, rare).

The article gives the detailed clinical histories of twelve cases of cyst and eight cases of primary or secondary fistulae studied histologically.

With regard to the origin of these conditions De Gaetano states that, with the exception of the thymus and thyroid, branchial ectodermic or endodermic formations are no longer present in the human embryo of 21 mm. Embryologically, all branchial malformations are lateral since the branchial sulci do not reach the median line; even the precervical sinus is lateral. However, in later embryological development these lateral formations, in their superficial portions at least, are pushed forward by the development of the sternocleidomastoid muscle. Thus, according to their depth, the branchial rests vary in their relation to the median line.

On the basis of clinical and histopathologic findings De Gaetano has come to the conclusion that the incidence of cysts has little relation to sex. The influence of age is more manifest. Cysts develop between the ninth and the fiftieth years; fistulae, between the sixth and twenty-seventh years. Mucoïd endodermic branchial cysts usually develop late. Median fistulae having their origin in the thyroglossal tract are almost always secondary to median cysts which have opened spontaneously because of supuration or have been opened by operation.

Dermoid cysts are most frequently on the median line, rarely being lateral. If they were of branchial origin they would be lateral and probably above the thyroid. If they originate from invaginated epithelium of the floor of the mouth, they may be considered perhaps of ectodermic origin. The cysts of endodermic origin have polystratified epithelium; hence buccopharyngeal epithelium of adult type.

Operation on such cysts should always be radical. Not only the cyst itself, but all the surrounding tissues should be removed as microscopic examination of the latter often reveals other embryonic cells of the same type. Similarly in the author's cases of fistula the surgical removal included both the whole fistulous tract and all the surrounding tissues. In none of the cases so treated was there any recurrence.

The case histories are very complete and nearly all of them are illustrated. W. A. BRENNAN.

Detzel, L.: Congenital Fistulæ of the Neck (Ueber Fistula colli congenita). *Muenchen. med. Wochenschr.*, 1921, lxiii, 1227.

Acherson, in 1878, was the first to give a correct interpretation of the disease picture of congenital fistulæ of the neck. A distinction is made between median and lateral fistulæ. The median correspond to the thyroglossal duct. The inner opening of a lateral fistula is in the lateral wall of the pharynx or the tonsillar region, while its outer opening frequently lies in the median line. Therefore its course can be determined only by sounding. The lateral passage penetrates the platysma muscle and superficial fascia, runs parallel to the sternocleidomastoid over the deep fascia above the sternohyoid and sternothyroid muscles to the great cornu of the hyoid bone, and continues between the external and internal carotids under the digastric to the lateral wall of the pharynx; the glossopharyngeal and hypoglossal nerves run under it. It is lined with pavement and columnar epithelium, mucous glands, and lymphoid elements.

The author reports a case which appeared to be a congenital lateral fistula, but presented histologic peculiarities. The patient was an 18-year-old girl from whose neck was excised a passage the thickness of a pencil, 6 cm. long, which terminated in a blind end in the region of the styloid process. The outer end was surrounded by a cartilaginous plate for a distance of 2 cm. Histologic examination showed a stratified basement epithelium with sudoriparous and sebaceous glands, and on the outside a ring of hyaline cartilage.

The large amount of cartilage is a variation from the usual picture. The passage must be considered as a dermoid cyst with secondary perforation, and the cartilage as a heteroplastic tissue formation, the independent development of an anlage intended for the styloid process or the hyoid bone (second branchial arch).

FISCHER (Z).

Sistrunk, W. E.: Cysts of the Thyroglossal Tract. *Surg. Clin. N. Am.*, 1921, i, 1509.

Cysts of the thyroglossal tract develop through failure in the complete obliteration of the epithelium carried down by the descent of the thyroid early in foetal life. If the epithelium fails to disappear, isolated areas of thyroid tissue (aberrant thyroid) or cysts may arise along the course of the duct. The diagnosis is made by the finding of a firm, cystic



tumor in the median line of the neck, usually near the hyoid bone or the thyroid cartilage. The duct running from the cyst to the hyoid bone can usually be palpated.

Cure of the condition requires complete excision of the epithelium-lined tract as recurrences often develop if the removal is not complete. Operation is carried out through a transverse incision 5 cm. long made across the neck at the level of the hyoid bone. The duct is removed with the tissues surrounding it for a distance of 0.3 cm. on all sides and with a portion of the hyoid bone, a portion of the raphé joining the mylohyoid muscles, portions of the geniohyoglossus muscles, and the foramen cæcum (see Fig.). The opening in the mouth is closed, the geniohyoglossus muscles are approximated with catgut sutures, and the cut ends of the hyoid bone are brought together with chromic catgut sutures. As far as is known, no recurrences have taken place when this type of operation was used.

G. H. JACKSON, JR., M.D.

Slesinger, E. G.: Non-Thyrototoxic Goiter. *Practitioner*, 1921, cvii, 355.

Slesinger offers the following general classification of goiters as the basis of his discussion:

Innocent goiter:

1. Parenchymatous goiter: physiological, toxic, congenital, acquired.
2. Colloid goiter: adenoma; diffuse; diffuse adenomatous (cystic, fibrous, calcareous, osseous).
3. Foetal adenoma.
4. Hyperplastic thyrototoxic goiter (Graves' disease).

Malignant goiter:

1. Epithelial tumors: carcinoma, malignant adenoma, metastatic colloid goiter, parastruma, postbranchial goiter, papilloma, cancrroid.
2. Connective-tissue tumors: sarcoma, endothelioma, perithelioma.

Following a general description of the gross and histologic pictures presented by each of the types of innocent goiter, the author considers their symptoms and the indications for surgical treatment, placing prime importance upon compression of the trachea and interference with the recurrent laryngeal nerve. The latter is stated to be far more common on the left than on the right side, even in cases of right-sided goiter, and occurs three times more often in men than in women.

Interference with the sympathetic nerve causes unilateral symptoms. The author distinguishes between the "goiter-heart" which sometimes develops in old cases and the thyrotoxic heart. The symptoms of the former are breathlessness followed later by vertigo, congestion of the face, epistaxis, palpitation, and ultimately oedema and anasarca. The author suggests that this is due partly to the "goiter stenosis interfering with the pulmonary compensation during the expansion of the thorax in respiration."

The necessity of determining the presence of hypo- or hyper-thyroidism is emphasized.

From these premises Slesinger concludes that surgical intervention is indicated in the presence of any pressure symptoms, especially in cases of adenomata because of their tendency to increase in size and undergo malignant change. Whether or not the question of deformity should influence the treatment must be determined by the circumstances in the particular case. As further evidence in support of the advisability of surgical treatment are cited the dangers of sudden death to which the goiter patient is exposed.

In the discussion of malignant goiters it is stated that in 90 per cent the malignancy developed in a pre-existing goiter and that more than 40 per cent of the patients are over 40 years of age.

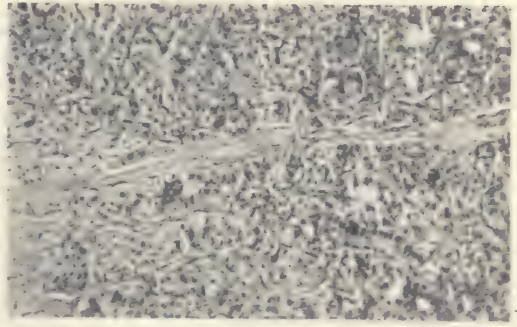
In malignant cases the invasion of neighboring structures occurs early, a fact which contributes to the difficulty of satisfactory treatment. Even tracheotomy when called for is a difficult and dangerous procedure on account of the vascularity of the growth and the invasion of the surrounding parts, and even if it can be performed, death from bronchopneumonia usually follows.

The author's general conclusion is that goiters other than the small parenchymatous or colloid varieties which have been present for some time and have any of the symptoms which we have taken as surgical indications should be operated on, and that in advising operation we should bear in mind the additional point that we are removing a potential, if remote, danger of malignant trouble.

W. O. HARTSOCK, M.D.

Wilson, L. B.: Illustrative Cases of Malignant Tumors of the Thyroid. *Surg. Clin. N. Am.*, 1921, 1, 1291.

Malignant tumors of the thyroid are relatively more frequent than is generally supposed, but their diagnosis is often missed because in the early stages



Proliferating foetal adenoma; "Wucherende Struma," Langhans (x1100).

they resemble other conditions, and because we fail to follow the cases to their final outcome to check the diagnosis.

The more common tumors of the thyroid are slow to develop; the period of growth may extend over many years. Three cases are described which illustrate this protracted course. In the case of a man, aged 45 years, a diagnosis of adenocarcinoma was made. There had been some enlargement on the right side of the thyroid for three years. Death resulted from lung metastases three years and ten months after operation. The second case described was that of a woman, aged 28, who had had a goiter since childhood. Sections of the growth showed both "foetal adenoma" and an actively growing papilloma. At a subsequent operation five and one-half years later an adjacent lymph node showed metastatic carcinoma. The patient died in two weeks and at autopsy metastases were found in the lung. In a third case of this slow-growing type nine years elapsed before the return of the tumor forced the patient to consult a physician. The type of proliferating "foetal adenoma" found at the first operation is shown in the illustration. From his study of thyroid tumors Wilson is led to conclude that all are derivable from this source. He believes that in a slow-growing, nodular tumor showing proliferative adenomatous tissue the prognosis should be guarded and may be given with more certainty as a preponderance of regenerative or degenerative changes is noted. A patient having such a tumor should be kept under observation for at least ten years.

Two cases are described showing tumors of rapid growth, one a sarcoma, the other an adenocarcinoma. Loss of weight is marked in all these cases and the presence of goiter over a long period is a prominent feature. Wilson estimates that of 290 patients with malignant tumors of the thyroid examined in the Mayo Clinic from January 1, 1901, to January 1, 1921, 158 had definitely developed goiter before they were 30 years of age. Only sixty-one had not noticed enlargement of the thyroid previous to one year before the diagnosis of malignancy was made.

J. W. ROSS, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Lenormant: Decortication of the Lung in Chronic Purulent Pleurisy (Sur la décortication du poumon dans les pleurisy purulentes chroniques). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 1160.

Cases of chronic fistulous purulent pleurisy are becoming less frequent since the methods of treating the acute condition have been improved. Lenormant has seen only ten cases. These were treated by thoracotomy. During the same period he performed forty-eight thoracotomies for acute purulent pleurisy or suppurative hemothorax. Twelve of these patients died later and six of the remaining thirty-six had a fistula which necessitated a second operation. Thus about 16 per cent of the acute cases became chronic. Most of them were due to influenza.

Of ten cases of pleural fistula five were treated by extensive thoracotomy, one by thoracotomy and pneumopexy, and four by decortication and freeing of adhesions. The first of the latter four cases was a case of purulent pleurisy on the right side following typhoid fever; the second was a case of suppurative hemothorax due to a pulmonary contusion; the third, a case of septic pleurisy; and the fourth, a case of doubtful pathology in which bronchopulmonary complications and pleurisy followed appendicitis. The results in all four cases were quite satisfactory.

Lenormant states that, when it is possible, decortication is preferable to thoracotomy and thoracoplasty in the treatment of chronic empyema as it tends to re-establish the function of the lung by freeing it. The operations on the chest wall are more mutilating and the diseased lung is immobilized by newly formed membranes. Duvergey reported a series of forty-eight cases of chronic purulent pleurisy treated by thoracoplasty and decortication in which there were forty-seven recoveries and only one death. This and other reports and Lenormant's own experience demonstrate that pulmonary decortication is possible in the majority of cases. The surgeon must know how to make a good cleavage plane between the parietal pleura and the false membrane. With careful operative technique there need be little hemorrhage. The operation must be performed as soon as it is certain that the pleural cavity will not become cured spontaneously. In the four cases reported in this article it was done three weeks and one, two, and one-half months respectively after the preliminary thoracotomy. Lenormant decorticates the visceral pleura alone without touching the parietal pleura, but states that, as reported by Roux-Berger and Donati, there are cases which require total decortication. With these surgeons he agrees also that a pneumopexy will often be necessary.

W. A. BRENNAN.

Butler, E. F.: Chronic Empyema. *Mil. Surgeon*, 1921, xlix, 544.

Every chronic empyema has its origin in an acute empyema. The factors which predispose to chronicity are three-fold: infection by such organisms as the tubercle bacillus which gives rise to chronic inflammatory processes; low resistance on the part of the patient; and poor care in the early stages of the condition. The immediate causes of chronicity are infection by the tubercle bacillus or a similar organism; faulty mechanics of drainage; foreign bodies in the cavities or sinus; osteomyelitis of the ribs adjacent to the drainage wound; pleuropulmonary communications; and residual foci of infection in the walls of the cavity.

Unless a cavity empties readily and completely when the patient is in the upright position there is a mechanical fault in the drainage. For perfect drainage the drainage wound must lead to the lowest portion of the cavity and must be large enough to permit free egress of the secretions so that there will be no diverticula or undrained pockets. Neither sterility nor obliteration of the cavity can be secured in the presence of foreign bodies. Clean elimination by rongeur of all portions of the rib stumps that have been denuded of their periosteum will go far to prevent osteomyelitis and the formation of foreign bodies due to sequestra thrown off from infected ribs.

In an appreciable percentage of cases there are communications between the air passages of the lung and the empyema cavity, and with every respiratory effort infected material is forced out of the bronchioles into the cavity. With the patient in a position in which the cavity can readily be emptied, gentle irrigation with small amounts of Dakin's solution should be tried, and if coughing results there is presumptive evidence of a bronchial fistula. If the patient can taste the solution the condition is practically proven. In a large group of cases of chronic empyema which resist all efforts to sterilize the cavity there is residual infection of the scar tissue lining the cavity.

X-ray study is extremely important. When it is known that there are no large bronchial fistulae, stereoscopic X-ray plates of the injected cavities may be made. In this work the bismuth-cottonseed-oil suspension described by Stevens has proved satisfactory.

To determine whether the cavity has been sterilized sufficiently to permit its closure, reliance should be placed upon the culture method rather than smears.

From a theoretical standpoint cure depends on four factors: the elimination of the cause, the improvement of the patient's general physical condition, sterilization of the cavity, and obliteration of the cavity. Bronchial fistulae are not easy to

eliminate. Unless they are situated close to the wound in the chest wall it will be necessary to make a free opening to expose them. If they are small they may be treated directly with the actual cautery. If they are large they must first be dissected free from the fibrous lung tissue surrounding them before they are cauterized.

The improvement in the patient's general health is of extreme importance. A diet fairly high in calories is usually necessary. Outdoor sleeping, whenever practical, is to be urged. The use of blow-bottles and similar means to expand the lung will not be as effective in chronic as in acute empyema. Routine calisthenics are better.

The direct method of sterilizing the cavity is by vigorous antiseptic treatment. Dakin's solution has apparently given the best results and may be considered the antiseptic of choice. As the amount of exudate decreases the amount of Dakin's solution should be decreased. If bleeding occurs, a rest of twenty-four hours is usually sufficient to control all capillary oozing. After this, dakinization of the cavity can be begun again. About 50 per cent of the chronic empyema cavities can be sterilized by intensive treatment with Dakin's solution.

Obliteration of the cavity is the final step in the cure of any given case. Surgical obliteration of the cavity by thorocoplastic operation is a serious procedure and should be undertaken only after all conservative measures have been attempted. Decortication through a wide intercostal incision is the most conservative operation. If this is not successful, an operation to eliminate the greatest amount of bacteria-bearing tissue is indicated.

RALPH B. BETTMAN, M.D.

Fitzwilliams, D. C. L.: The Site of Operation for Empyema. *Brit. M. J.*, 1921, ii, 550.

The author has seen but two cases of empyema necessitatis. Both were those of children, and in both perforation occurred between the second and third ribs in front.

In large abscess cavities the drainage must be so arranged as to allow the lung to come up to the other walls gradually and evenly and obliterate the cavities. Opening at the most dependent part, too far back, or too far forward defeats this object. The lowest and highest points will be where the expanding lung first touches the chest wall, and thus drainage from these points will be obstructed. The opening should be opposite the deepest point of the cavity which will be closed last.

To maintain a level established by resection of the seventh rib at the posterior axillary line there is no objection to resection of the sixth, fifth, or even the fourth rib as one comes forward to the anterior axillary line. Resection of the ninth rib for empyema has a limited field. The ninth rib lies wholly below the normal lung level in front of the posterior axillary line, while the eighth rib is below that level in front of the anterior axillary line. Only near the erector spinæ would it be of any use to

resect this rib, and then the expanding lung would soon render the opening useless. Moreover, when the pouch of pleura between the chest wall and diaphragm becomes obliterated below the lung level, resection of the ninth rib may lead to opening of the diaphragm under the impression that it is thickened pleura.

Poor drainage is the most frequent cause of large unhealed cavities within the chest wall. The most common condition found is a narrow passage into the cavity. It is these cases, often long continuous, which require decortication. The vast majority of those in which more extensive rib resection is necessary to allow the chest wall to obliterate the cavity by falling in upon the stationary lung the openings were situated too low down for good drainage.

J. E. STRUTHERS, M.D.

Riedel, G.: A Life-Saving Operation for Prevertebral Tuberculous Abscess in the Posterior Mediastinum. (Lebensrettender operativer Eingriff bei praevertebralem tuberkuloesem Abscess im Mediastinum posticum). *Muenchen. med. Wchnschr.*, 1921, lxxviii, 1190.

Of late years operative treatment for so-called "surgical tuberculosis" has been somewhat out of favor. The followers of Bier take an extreme stand on this question, limiting themselves to puncture of superficial cold abscesses. Every other operative procedure they condemn, even puncture of deep abscesses, as they believe the latter undergo absorption. Riedel does not agree with this extremely conservative view and cites a case to show that under certain circumstances operation is necessary to save life.

The patient was a boy 6 years old who had a familial history of tuberculosis and suffered from caries of the third and fourth thoracic vertebrae which was revealed clinically by a gibbus and in the roentgen picture by destruction of the bodies of the third and fourth vertebrae and an abscess shadow. After confinement to bed for a considerable time he suddenly experienced several severe attacks of dyspnoea. At first these were eased by the upright position but later no relief could be found and tracheotomy was considered. Tracheoscopy, however, revealed a normal condition of the larynx and trachea, the difficulty being due to the abscess originating in the vertebrae. Therefore, in order to save the patient from asphyxiation, evacuation of the abscess was necessary.

The third, fourth, and fifth ribs were resected close to the spinal column, and the pus found by the syringe was drawn off by a rubber drain. Immediately after the operation breathing became much easier, and after several months in bed the patient was cured.

The abscess in this case had its origin in the third and fourth vertebrae and extended into the posterior mediastinum. The trachea was compressed by it at about the level of the bifurcation. It is surprising that there was no dysphagia.

In such a case of caries of the lower cervical and upper thoracic spine it would be a mistake to apply a plaster-of-Paris jacket as the forced lordosis would cause earlier compression of the trachea. A number of such instances are reported in the literature. In the majority, a tracheotomy was performed, but of course with a negative result. While tracheoscopy is unable to give the necessary information in this condition, the diagnosis can always be made easily with the aid of the roentgen ray. To refrain from operating in such a case would be to give the patient up to speedy death by asphyxiation. GANGL (Z)

Bloodgood, J. C.: The Pathology of Chronic Cystic Mastitis of the Female Breast: With Special Consideration of the Blue-Domed Cyst. *Arch. Surg.*, 1921, iii, 445.

Bloodgood subdivides chronic cystic mastitis into the following types: chronic cystic mastitis with single or multiple cysts; chronic cystic mastitis without large cysts; the blue-domed cyst; the cyst of the galactoceles type; multiple blue-domed cysts in one or both breasts (diffuse cystic disease of the breast); non-encapsulated adenomatous area; the non-encapsulated area of chronic cystic mastitis containing one or more minute cysts or one or more dilated ducts or both; diffuse dilatation of the ducts, chiefly in the nipple zone, and rarely in the breast outside this zone; the non-encapsulated cystic adenoma; and the diffuse non-encapsulated cystic adenoma known in the literature as Schimmelbusch's or Reclus' disease.

In the blue-domed cyst the characteristic gross feature is a distinct blue dome. In the majority of cases this is exposed after division of the subcutaneous fat. In a certain percentage of cases the cyst is buried in the breast tissue and division of a zone of breast is necessary to expose it. As a rule the cyst wall is thin; in less than 10 per cent of the cases it has been found thicker than 2 to 3 mm. The contents of the cyst have never been hemorrhagic; they are either clear or cloudy. The inner wall of the cyst is smooth, without papilloma, and there may be partial partitions or septa.

The cyst of the galactoceles type differs from the blue-domed cyst in that the dome of the former is white or gray and as a rule the wall is a little thicker. The contents not only resemble milk in appearance, but also are coagulated by formalin, while the contents of the blue-domed cyst are not.

Most multiple cysts in one or both breasts (diffuse cystic disease of the breast) are of the blue-domed type, but a few may be of the galactoceles type. The breast or breasts are riddled with cysts of various sizes. The character of the wall and the contents are identical with those of the blue-domed type. The frequency of this multiple cystic disease is about 13 per cent.

The non-encapsulated adenomatous area occurs as an area of breast tissue in which the elevated pink and gray dots representing the adenomatous lobules are more numerous than in the surrounding breast.

This area resembles somewhat the fibro-adenoma, but has less stroma. When the condition presents itself clinically as multiple, somewhat indefinite nodules in one or both breasts, each nodule is practically identical in the gross and microscopic picture. The author is inclined to the conclusion that, when multiple, the disease corresponds to that described by Warren as the "cobble-stone breast," and that when it is possible to make out multiple, indefinite nodules in both breasts operation is not indicated. A definite tumor should be explored.

A non-encapsulated area of chronic cystic mastitis containing one or more minute cysts or dilated ducts or both should be explored if it occurs clinically as a single tumor.

Diffuse dilatation of the ducts chiefly in the nipple zone suggests on palpation a doughy, worm-like mass beneath the nipple. On exploration, large and small dilated ducts with distinct walls containing brown, green, milky, or cream-like material of various degrees of viscosity and consistency are found. When it occurs in a zone of the breast outside the nipple area it feels like diffuse mastitis, but has not the distinct edge or border of the diffuse non-encapsulated cystic adenoma. If it is possible to diagnose this lesion by palpation, operation is not indicated.

Non-encapsulated cystic adenoma does not differ from encapsulated cystic adenoma except in regard to the capsule.

In Schimmelbusch's disease palpation discloses a zone of mastitis containing many small shot-like masses. The edge of the involved breast is distinctly palpable. The disease may involve a quadrant, a hemisphere, or both breasts. In a few cases it is associated with intermittent retraction of the nipple, and if operation is delayed the retraction becomes permanent.

The breast surrounding these tumors or cysts shows evidence of chronic cystic mastitis or normal or senile breast tissue. In the author's opinion, chronic cystic mastitis is not a lesion of the breast which at the present time may be considered precancerous, and its presence does not demand either the complete excision of the breast or the complete operation for cancer. Among 350 cases of chronic cystic mastitis of the various types described, 222 cases of involvement of the whole breast were studied but no evidence of gross or microscopic cancer was found. The presence of one distinct tumor in each breast or more than one tumor in one or both breasts still clinically benign practically makes the diagnosis of a benign lesion.

If there is a single tumor in one breast and the remaining portion of this and the other breast is normal and the patient is over 25 years of age, immediate operation is indicated.

In exploratory incision the patient is always prepared for the complete operation for cancer and for general anesthesia.

The incision should be made directly over the lump. The moment the operator exposes the tumor

and concludes that it is malignant the exposed area should be swabbed with pure phenol followed by alcohol and the wound packed with a piece of gauze saturated with zinc chloride solution and closed. The complete operation for cancer should then be done.

This article has numerous illustrations showing the different varieties of mastitis described, and the author gives and analyzes many case histories.

H. A. McKnight, M.D.

TRACHEA AND LUNGS

Lloyd, S.: Observations upon the Surgery of the Lung. *Ann. Surg.*, 1921, lxxiv, 557.

Lloyd summarizes the present indications for operations on the lung as follows:

1. Cases of tuberculous cavities in which collapse of the lung by gas injections into the pleural cavity is impossible either because of too rapid absorption of the gas or because of the presence of adhesions. In such cases extrapleural thoracotomy should be performed. This may be done in one operation or in stages, depending upon the patient's condition.
2. Bronchiectasis. Extrapleural thoracotomy may be performed, although incision and drainage or lobectomy offer a better chance of radical cure.

3. Foreign bodies which cannot be removed by bronchoscopy. In such cases thoracotomy with direct removal by incision through the lung is the method of choice.

4. Hæmorrhage with increasing hæmothorax, compression of the lung, and displacement of the heart and mediastinum. Thoracotomy with suture of the bleeding point is indicated.

5. Abscess. The best results will be obtained by thoracotomy and drainage of the abscess effected by attaching the pulmonary pleura about the opening of the lung to the parietal pleura.

6. Tumors of the chest wall, including the ribs and pleuræ. Complete removal and the use of a pedunculated skin flap from the abdomen has been successful.

7. Tumors of the lung. Thoracotomy and direct excision by partial or complete lobectomy offer the only chance of cure.

8. Empyema. Early and frequent aspiration followed, if necessary, by intercostal incision and drainage is indicated.

If these methods are not efficacious, one of the radical operations should be performed. The author discusses methods of preventing untoward results from pneumothorax.

FREDERICK CHRISTOPHER, M.D.

HEART AND VASCULAR SYSTEM

Hedblom, C. A.: Primary Tuberculous Pericarditis. *Surg. Clin. N. Am.*, 1921, i, 1411.

Tuberculous pericarditis is usually secondary to a lesion elsewhere in the body. In the order named, the most common foci are the mediastinal or tracheobronchial lymph glands, the lungs, and the

pleuræ. In some cases the pericardial process is part of a general polyserositis or a general miliary tuberculosis. It is probable that most cases of pericarditis that cannot be proved pyogenic are tuberculous.

Thym reports five of ninety-four cases in which the condition was probably primary in the pericardium. Osler found the pericardium involved in seven of 275 cases. Willgk found eleven cases in 1,317 autopsies. Wells discovered pericardial adhesions in 128 of 1,048 autopsies. In all these autopsy cases the process was acute in seventy-one and chronic in fifty-seven, and of the acute cases eight were proved to be tuberculous. Metcalf noted that the pericardium was involved in 5 per cent of cases of active tuberculosis.

McPhedran believes the lymph glands are always the seat of primary infection, the various organs and tissues subsequently infected being invaded by way of their lymphatic tissues. On this basis may be considered all cases of tuberculous pericarditis associated only with involvement of the mediastinal or tracheobronchial lymph glands.

The author reports the case of a man, aged 36 years, whose trouble began eleven months previous to examination, May, 1921, with a sore throat, fever, and loss of weight and strength. Finally there was bilateral phlebitis in the legs associated with night sweats, pain at the costal margins, and cough without sputum. Later dyspnoea and cyanosis developed. In three pericardial aspirations 2,500 c. cm. of fluid were withdrawn. The first two aspirations were clear but the third had the appearance of pea soup.

Examination revealed limitation of movement in the lower chest, slight respiratory retraction at the apex with obliteration of the cardiohepatic angle, and distant and rapid heart sounds. No murmur or arrhythmia was noted. When the patient assumed the recumbent position the veins of the neck were engorged and his face became cyanosed. The blood pressure was 108 systolic and 88 diastolic. The pulse rate was 110.

Roentgen examination showed the heart to be enlarged to 26 by 16 by 10 cm. The electrocardiogram showed evidence of myocardial degeneration.

A tentative diagnosis of tuberculous pericarditis with effusion was made and pericardiotomy advised.

Exploration of the pericardium revealed no trabeculated cavities; 2,000 c. cm. of seropurulent fluid were aspirated and the wound closed without drainage. The specimen revealed tuberculosis. Guinea-pig inoculation of the exudate gave a negative result.

The patient returned two months later with thrombophlebitis of the legs. He had gained in weight, but was still dyspnoic. A roentgenogram showed a large cardiac shadow. Pericardiotomy was performed and 2,000 c. cm. of seropurulent fluid were aspirated. The intrapericardial pressure was found to fluctuate with respiration between 4 and 12 cm. of water pressure.

The parietal pericardium was covered with a whitish fibrinous membrane about 8 mm. thick. The pericardium itself was about 4 mm. thick. Repeated examinations during evacuation of the fluid showed no change in the blood pressure. The wound in the subcutaneous tissues and skin was completely closed by suture, but the pericardial incision, 2.5 cm. long, was left open for drainage.

A seropurulent discharge from the wound became purulent, and three weeks after the operation there was a serous pleural effusion on the left side. A roentgenogram revealed collapse of the left lung. Thrombophlebitis of the left jugular and subclavian veins, and oedema of the right hand and arm, the upper chest wall, the abdominal wall, and the legs developed. Dyspnoea and cyanosis were present. By thoracentesis twenty-nine days later 700 c. cm. of clear, serous effusion were evacuated. No apparent increase in pericardial effusion was revealed by the roentgen ray. The patient left the hospital September, 1921, with a poor outlook for recovery.

The diagnosis was based on the chronicity, the recurrence of effusion after three aspirations, and the history of recent exposure to tuberculous infection. The presence of a relatively large sterile effusion was also suggestive.

J. E. STRUTHERS, M.D.

PHARYNX AND ŒSOPHAGUS

Von Masseri, C.: The Removal of Deep Foreign Bodies from the Œsophagus Through the Opened Stomach (Zur Entfernung von tiefsitzenden Fremdkörpern der Speiseröhre vom eröffneten Magen aus). *Zentralbl. f. Chir.*, 1921, xlviii, 1077.

Von Masseri reports a case in which an unsuccessful attempt was made to remove through the opened stomach a plum stone lodged in the Œsophagus 33 cm. behind the teeth. The patient was a young girl. The stone had become firmly wedged into the mucous membrane and lay parallel to the longitudinal axis of the Œsophagus. All attempts to mobilize it by retrograde dilation with a bougie or to grasp it with instruments inserted through the stomach were of no avail. The patient died sixteen hours after the operation.

Von Masseri believes that stenosis had already developed at the point of encarceration. The patient had been in the habit of swallowing the stones with the plums, and in the author's opinion this was probably responsible for repeated small injuries leading to the formation of the stenosis.

DENCKE (Z).

Lang, F. J.: Carcinosarcoma of the Œsophagus (Zur Kenntnis der Carcinosarkome des Oesophagus). *Arch. f. path. Anat.*, 1921, ccxxxiv, 485.

To the five cases of carcinosarcoma previously observed Lang is able to add two others.

By the term "carcinosarcoma" is meant a cancerous tumor with a sarcomatous stroma. Herxheimer, who made a careful study of these neo-

plasms, gives the theories as to their origin as follows:

1. Carcinoma and sarcoma arise simultaneously from the same cause, but affect different tissues.

2. On the basis of an existing sarcoma an atypical growth of the epithelial cells arises which leads to the formation of carcinoma in the midst of the sarcoma.

3. The stroma which is always present in a carcinoma develops into a sarcoma.

The first of the two cases reported by Lang in this article was that of a man 67 years old who showed evidences of Œsophageal stenosis and died of cardiac weakness. Autopsy demonstrated the immediate cause of death to have been lobar pneumonia on the left side. In the Œsophagus, at the level of the bifurcation, was a tumor which constricted the Œsophageal lumen to the thickness of a lead pencil but involved only the anterior wall and did not spread beyond. The neighboring lymph nodes were not affected, but in both lobes of the liver there were numerous metastatic nodular growths.

On histologic examination it was found that the upper portions of the tumor showed a round- and polymorphonuclear-celled sarcoma with occasional giant cells, whereas in the lower portions there was, in addition, a carcinoma penetrating from the surface to the depth. There were also small and large epithelial cell nests either close together or isolated in the middle of the sarcomatous tissue. The outline of some of these epithelial masses was ill defined while that of others was sharply defined, suggesting a connective tissue capsule. The metastases in the liver proved to be purely sarcomatous.

The second case reported was that of a man 52 years old who had suffered with dysphagia for two years. Later there were associated attacks of severe dyspnoea, the cause of which was believed to be a large goiter on the right side. Removal of the goiter did not decrease the dyspnoea and the patient soon died from pneumonia.

At autopsy a segmented, hard, white tumor was found in the Œsophagus, beginning in the cavity of the larynx and extending to the bifurcation. This growth involved the whole Œsophageal wall and narrowed the lumen to the thickness of a lead pencil. Projecting into the lumen 2 cm. further down was a cylindrical pedunculated neoplasm. The lymph nodes in the vicinity were not involved. Microscopic examination showed the circular tumor to be a carcinoma and the conical tumor to be a spindle and giant-cell sarcoma infiltrated by a basal-cell carcinoma. No metastases were found.

GANGL (Z)

Bidgood, C. Y.: A Study of Methods of Procedure in Resection of the Œsophagus. *Ann. Surg.*, 1921, lxxiv, 546.

Because of the situation and structure of the Œsophagus its surgical treatment is difficult. In its cervical portion it is easily mobilized, but in its thoracic portion it lies deep in the mediastinum in

juxtaposition to such delicate and important structures as the pericardium, trachea, pleura, the vagi, left recurrent laryngeal, and sympathetic nerves, the thoracic duct, the aorta, the left subclavian artery, and the azygos vein. Mobilization here is therefore extremely difficult. From the standpoint of microscopic anatomy it is seen that there is no definite coat, such as the submucous layer in the intestine, which is sufficiently strong to hold the suture in place. This makes it difficult to procure a line of suture which will withstand tension, and as the œsophagus is fixed at its upper and lower ends, each descent of the diaphragm during inspiration causes a strain on the line of union and favors leakage.

Other factors adding to the difficulty and danger of œsophageal resection are: (1) the impossibility of stretching the œsophagus to approximate the two ends after the excision of a portion. (2) the absence of a serous coat and the consequent failure of adhesions to form around the line of union and prevent leakage, (3) the low resistance to infection of the loose connective tissue of the mediastinum; and (4) the constant presence of bacteria in the œsophageal lumen.

The author discusses the history of operations upon the œsophagus, analyzing and describing twenty-five cases collected from the literature. According to the statistics, the skin tube procedure is the method which has been used with the best results during the last ten years and should be the method employed in cases of carcinoma and stricture of the œsophagus when cure by dilatation with bougies is impossible.

FREDERICK CHRISTOPHER, M.D.

Fonio, A.: A Case of Antethoracic Œsophagoplasty
(Ein Fall von antethorakaler Oesophagoplastik).
Schweiz. med. Wchnschr., 1921, li, 865.

The author reports a case of successful œsophagoplasty with drawings, roentgen pictures, and schematic sketches of the operation. Following injury to the œsophagus the permanent bougie should be used according to the method of Roux as early as possible. In late cases sounding may be tried; in some instances the retrograde method may be found best. If this is unsuccessful, a gastric fistula should be established. However, as fistula-life is depressing to the patient, the formation of an artificial œsophagus is to be considered.

The case reported was an impenetrable œsophageal stricture at the level of the jugular vein due to a burn by potassium permanganate and treated for years until a mediastinitis with empyema developed. An antethoracic œsophagoplasty was carried out in the following steps and completed in a year and five months:

1. A cylinder of skin was formed which extended from the manubrium to the ensiform process of the sternum.

2. One month later, the distal end of an excised segment of the transverse colon, 15 cm. long and

connected with the median colic artery, was transplanted into the stomach and its oral end transplanted into the freely prepared lower end of the skin cylinder by means of a double suture after the border of the skin cylinder had been split into two parts. The anastomosis was effected by a mucop-epidermic and sero-subcutaneous suture similar to Lembert's mucosa-mucosa and serosa-serosa sutures for end-to-end anastomosis. Over this a second serosa-subcutaneous suture was inserted to obtain invagination. Primary healing followed, which the author ascribes to the technique of the intestinal skin suture.

At several later operations it was necessary to lengthen the skin tube above as it had shrunk considerably in length, and to perform several operations to close a fistula which developed between the two parts of the skin tube. A year and five months later, in order to guard against inflammatory complications, the œsophagus was removed after preparation lasting over several days, and washed with bismuth subnitrate. The upper end of the skin tube was then joined end-to-end to the œsophagus. The left lobe of the thyroid gland and the left inferior thyroid artery were resected in order to prevent hæmorrhage from the inferior laryngeal artery, and the sternomastoid and sternothyroid muscles, which had been divided at their insertion, were sutured on both sides to the upper lip of the skin wound.

The patient now takes nourishment through the newly formed œsophagus. The function of a valve is performed by a deeply retracted cutaneous scar in conjunction with the muscles sutured to it.

The author emphasizes the following points: If the danger of fatal intestinal gangrene is to be avoided, the skin tube must be made as long as possible (at least 37 cm., or from 5 cm. above the jugular vein to the umbilicus) and the piece of intestine extending from the skin tube to the stomach must be as short as possible. The skin cylinder or tube should be made first, and only after its complete healing should the surgeon undertake the section of the intestine and the joining of the short intestinal loop to the stomach and skin tube. The joining of the two ends of the intestinal loop should be performed at one time. The danger of the method would be still less if it were possible to do without the intestinal loop connecting the stomach and skin tube.

Fonio reviews the historical development of œsophagoplasty, twenty-two successful cases, and six cases in which the final results could not be ascertained. He holds that antethoracic œsophagoplasty is indicated in cases of impenetrable benign stricture of the œsophagus which defy all attempts at the introduction of a bougie, but is not indicated for patients with carcinoma who either do not survive the operation or do not live to obtain the final result. The article is supplemented with a bibliography of twenty-nine references.

SONNTAG (Z)

MISCELLANEOUS

Lemon, W. S., and Barnes, A. R.: *Clinical and Surgical Experience in Diseases of the Chest, with Special Reference to Pneumothorax.* *Med. Clin. N. Am.*, 1921, V, 295.

Since Emerson's work in 1903, the conceptions of pneumothorax and the methods of treating it have been greatly influenced by four factors:

1. Roentgenology. The X-ray has become an invaluable diagnostic aid, especially in cases of small encapsulated hydropneumothorax, small collections in the presence of much fluid, large collections with adhesions preventing collapse, and cases which do not present clinical signs.

2. Local anesthesia. The use of local anesthesia allows the co-operation of a conscious patient with the surgeon. Danger signs can be recognized immediately and several-stage operations can be performed with less danger than under general anesthesia.

3. The world war.

4. The influenza epidemic. This provided much material for the practice of thoracic surgery and stimulated research.

Work by many observers correlated by the Empyema Commission led to a much clearer conception of the best methods of treatment. The experimental work of Graham and Bell was most valuable, though clinical experience seems to indicate that the mathematical limit as to the size of an opening does not influence surgical risk and that there is no necessity for a differential pressure apparatus.

The author presents the results of operations performed at the Mayo Clinic on 300 patients with thoracic diseases. Empyema occurred in 136 cases, pleurisy with effusion in 107, lung abscesses in 27, and twelve other conditions in a smaller number of cases. Local anesthesia was used 253 times, ether in 198 cases, and combined anesthesia in 21. The operations were as follows: aspirations, 244; rib resections, 130; exploratory operations, 30; drainage incisions, 26; plastic operations, 20; and several other operations in fewer instances.

Immediate complications consisted of a curious disturbance of the nervous system of unknown origin in twelve cases, dyspnea or cyanosis and cough in ten cases each, and open pneumothorax in three cases. In the cases of open pneumothorax the air was allowed to enter slowly at first until accommodation was obtained, the operation then being completed with as large an opening as desired. The surgeon should always be ready to convert an open pneumothorax into a closed pneumothorax if necessary. The behavior of the lung under such conditions is uncertain.

Aspiration is indicated in hydropneumothorax only for diagnostic purposes or to relieve serious dyspnea. It should always be done by a most rigid aseptic technique as conversion to pyopneumothorax is very apt to occur.

MERLE R. HOON, M.D.

Lockwood, A. L.: *The Developments and Possibilities of Thoracic Surgery.* *Surg. Clin. N. Am.*, 1921, I, 1425.

The author gives a résumé of the treatment of thoracic wounds from the time of Hippocrates up to, and including, the world war. From August, 1914, to late in 1916 thousands of young men died unnecessarily because surgery of the chest had not advanced to the same degree as the surgery of other parts of the body. In the autumn of 1916 came the realization that approximately 73 per cent of patients suffering from what were considered necessarily fatal wounds of the chest could be saved and restored to health and in most cases to more complete usefulness with less permanent disability than those suffering from wounds of other parts of the body.

The author reports the case of a man, aged 34 years, who was admitted to an advance surgical unit eight hours after he had received a bilateral gunshot wound of the chest. The missile had lodged in the liver. Examination revealed laceration of the diaphragm on both sides. Under paravertebral anesthesia the left chest was opened and the wound in the diaphragm excised and sutured. The tract and bed of the missile were excised *en masse* and the incision in the lung closed by suture without drainage. One and one-half hours later the same procedure was followed on the right side. The liver was exposed and the missile removed from its substance at a depth of 5 cm. Before the wounds were closed without drainage they were swabbed out with saline solution and ether. The postoperative treatment consisted of keeping the patient in a sitting position in bed, the administration of oxygen, and the administration of glucose by rectum and of sodium bicarbonate intravenously. The patient made an uninterrupted and easy recovery.

The second case reported was that of a man, aged 30 years, with a penetrating chest wound, extensive hemothorax, laceration of the diaphragm, liver, and kidney, and hernia of the colon. He was operated on six hours after his admission to the hospital following the intravenous injection of 600 c.cm. of sodium bicarbonate and a blood transfusion of 600 c.cm. The operation was performed almost entirely under local anesthesia without gas or oxygen. At its conclusion 500 c.cm. of sodium bicarbonate were given. Recovery was complete and uneventful. Forty-eight hours after the operation the lung was almost in complete expansion.

Repeated aspirations, or if advisable, the use of the trocar and cannula, and when necessary, intercostal thoracotomy will reduce the death rate of acute empyema to practically zero. If acute empyema is properly handled, chronic empyema rarely develops.

In the majority of cases lung abscess will clear up entirely if the patient is put to bed at once in the open air with postural drainage and is given alkalies to offset acidosis, glucose to maintain the glycogenic function, and forced feeding to maintain strength.

Only after such treatment has been given a thorough trial should surgical measures be attempted. Operation should be as conservative as possible and yet sufficiently extensive to allow evacuation, proper drainage, and obliteration of the cavity.

Bronchiectasis should be treated along the lines suggested for lung abscess. In certain unilateral cases partial pneumectomy or artificial pneumothorax is indicated. In bilateral cases partial rather than complete collapse of the more severely affected lung gives the best results.

Foreign bodies, wherever located, should usually be removed. In traumatic lesions in which the chest is crushed surgical interference is advisable.

Removal of comminuted bone and sharp spicules often prevents death from shock and exhaustion.

With regard to cases of subdiaphragmatic abscess, hernia of the diaphragm, and carcinoma of the cardia the author gives briefly what he considers to be the best approach. In cases of intrathoracic malignancy a limited resection of the chest wall should be performed if it will clear the growth, and if necessary may be done in two or three stages. If the deep supraclavicular glands show metastasis, if there is fluid in the thorax, or if the mediastinal glands show metastasis when the thorax is opened, further surgery is contra-indicated except for the relief of symptoms. In only one case has the author done more than explore or remove specimens for diagnosis. In only seven patients operated on or explored was the mediastinum, diaphragm, or pericardium free from extension. Because of the favorable effects of radium on lymphosarcoma elsewhere in the body, its use in lymphosarcoma of the thorax is strongly advocated. Roentgen-ray or radium treatment, however, should follow, not precede exploration. In the case reported, harm probably resulted from roentgen-ray treatment preceding exploration.

In certain cases in which excision of the mass is not feasible a palliative operation is advisable. Instances of deep precordial pain or vomiting due to extension to the pericardium or diaphragm are cited. In these cases the mass was stripped from the pericardium or diaphragm and, if possible, the healthy lung was turned over the raw exposed area and sutured. If this could not be done, the adjacent portion of the lung was usually collapsed so that it no longer came into contact with the raw area of the diaphragm or pericardium. All patients operated on in this manner were remarkably relieved.

Great stress is laid on the value of the roentgen ray and the necessity for repeated examinations during the progress of a case.

The author believes that until some simple means of maintaining anaesthesia is found, paravertebral anaesthesia should be employed and, if necessary, a small amount of gas and oxygen should be given during the manipulation within the chest. Ether and chloroform are contra-indicated in surgery of the chest unless the lung on the affected side is in expansion and adherent to the chest wall.

No alarming sequelæ ever follow a wide incision in the chest but respiratory distress frequently follows a small incision. Complete collapse of the lung is rare; one-half collapse is usually the limit. On the other hand, the lung frequently expands almost as if to force its way through the incision. In nearly 3,000 cases operated on for lesions of the chest there were only two deaths on the table.

The technique of paravertebral anaesthesia is given in detail with an illustration showing the points of paravertebral injection.

The operative technique and postoperative treatment employed by the author are fully described and some of the instruments used are pictured.

J. E. STRUTHERS, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Reschke, C.: Experiments To Determine the Influence of Hypertonic Solutions on Peritoneal Absorption, with the Object of Using Such Solutions in Peritonitis (Versuche ueber die Beeinflussung der peritonealen Resorption durch hypertonsche Loesungen zwecks Anwendung solcher Loesungen bei der Peritonitis). *Arch. f. klin. Chir.*, 1921, cxvi, 466.

Numerous earlier investigations demonstrated that, at least in animal experiments, there is a considerable absorption of bacteria which have been introduced into the peritoneal cavity. This, however, cannot be regarded as a factor in healing, for if the virulence and number of the infecting bacteria are great enough, death results. As the abdominal cavity is able to tolerate a much greater number of bacteria than the blood stream, a large number of bacteria must be rendered harmless in the peritoneal space. The same is true of the toxins which are

given out by the bacterial bodies, arise through their destruction, or are formed in the abdominal cavity by fermentation.

The defense of the abdominal cavity itself against bacteria and their toxins is provided in part by the cells of the serosa and in part by the exudate brought out by the irritation. In the exudate, which is rich in leucocytes, chemical decomposition, especially of albuminous substances, takes place in addition to biological processes. These chemical changes constitute the body's chief defense against the infecting bacteria which have obtained entrance. We must therefore seek to stimulate the exudation and to check the harmful absorption.

The injection of chemically irritating substances—oil of turpentine or camphorated oil—causes exudation, and oil injections retard absorption. A considerable transudation into the abdominal cavity can be obtained also by osmosis if a solution of an otherwise indifferent substance with a higher con-

centration than the blood serum and the body fluid is injected into the peritoneal cavity.

The author shows by experiments and figures that the intra-abdominal introduction of salt or sugar in substance instead of in hypertonic solution increases transudation and diminishes the absorption of bacteria. The arrest of absorption, however, lasts only until a balance is reached. The transudate does not possess the marked bactericidal power of the exudate which the peritoneum yields to bacterial irritation but it influences the bacterial flora of the abdominal cavity in a different way. The decomposition of sugar forms many more harmless metabolic products than the breaking up of albumin, and the toxins and ferments which decompose albumin can be rendered harmless by the acids present. Coagulation of the blood and the formation of fibrin are thereby checked.

On the basis of his animal experiments, the author believes that it is possible to use hypertonic solutions as an adjunct in the treatment of clinical cases. From 1 to 1½ liters of a 20 per cent sugar solution should be distributed over the inflamed portion of the peritoneum and from 100 to 200 c. cm. of a 50 per cent solution introduced into the cul-de-sac of Douglas after the abdominal cavity has been sponged or washed out. The peritoneum should then be tightly sutured around a drain introduced into the Douglas cul-de-sac and the drain itself closed for a few hours. After some hours the solution should be drained and replaced by another supply. Immediately before the sugar solution is used, 2 liters or more of common salt solution should be injected intravenously to render the concentration of the sugar solution less harmful and at the same time to supply the material for the transudation.

RAESCHKE (Z).

Palier, E.: Peritonitis Acuta Circumscripta Catarrhalis. *Med. Rec.*, 1921, c, 943.

Peritonitis acuta circumscripta catarrhalis is characterized by a small localized area, several inches in diameter, of slight dull abdominal pain which is aggravated by deep pressure, walking, or exercise, and relieved when the patient lies down. There may be some nausea, and there is constipation which is not relieved by laxatives. Stool examination is negative.

The localized area of pain may be in the left iliac region or some other locality. There is slight elevation of temperature. The ailment may begin with a cold. It lasts from a few days to several weeks and seems to clear up rapidly under the use of salicylates, preferably strontium salicylate. As no postmortem examinations have been made, the exact pathology and etiology are not known, and consequently the name given the disease is as yet more or less vague.

Palier gives the history of the condition as it occurred in himself and in three other cases. He has been unable to find any previous account of it.

WALTER C. BURKET, M.D.

GASTRO-INTESTINAL TRACT

Balfour, D. C.: The Use of the Actual Cautery in Treating Benign Lesions of the Stomach and Duodenum. *Surg. Clin. N. Am.*, 1921, 1, 1233.

For centuries the cautery has been used as a hæmostatic, sterilizer, and counter-irritant, and it is one of the few therapeutic agents of antiquity that has endured to modern times. Heat not only destroys malignant cells, but does so without vitalizing healthy tissue.

In the Mayo Clinic the cautery has been used routinely in many conditions. It is applied to the edges of the stomach and intestine after removal of malignant growths; to malignant neoplasms of the bladder; in the treatment of the mouth, tongue, and jaws; and to epitheliomata of the skin. In non-malignant inflammatory conditions and in intractable infections of the skin cauterization may bring about healing when all other methods have failed.

Cauterization has become the most frequently employed procedure in the Clinic in the surgical management of gastric ulcer and certain types of duodenal ulcer. In a series of 437 gastric ulcers treated with the cautery the mortality rate was less than half the average rate of all other types of operations for gastric ulcer in the Clinic. At least 80 per cent of the patients have been afforded relief from symptoms, and the subsequent death rate has been considerably lower than the average death rate following all other operations. This is especially significant since it is due, at least to some extent, to the specific destructive action of heat on the cancer cell. The outstanding facts in cautery excision and gastro-enterostomy for ulcer of the stomach are the low operative mortality, the absence of post-operative morbidity, the high percentage of satisfactory symptomatic results, and the low incidence of late sequelæ. The cautery is particularly effective in destroying the bleeding type of ulcer, both gastric and duodenal, and decreasing the frequency of subsequent gastric hæmorrhage.

It is most applicable to the small ulcer involving the lesser curvature. In ulcers of the posterior wall of the stomach the cautery is used for a transgastric excision or for cauterization of the edges of the opening in the stomach after it has been separated from the pancreas.

The technique consists essentially in thorough cauterization of the actual ulcer after opening the stomach over it with the cautery. The surrounding tissue may be heated without increasing the size of the opening, and the selective action of heat utilized on any actual or potential cancer cell. Since the vulnerability of the cancer cell to heat is five times as great as that of the normal cell, this method possesses distinct advantages in the treatment of the few ulcers in which early malignant degeneration has taken place. The opening of the cautery excision is considerably smaller than that of knife excision of the entire indurated area. The induration disappears when the central point of infection is destroyed.

There is no active hæmorrhage when cauterization is carried out slowly. The opening is closed with interrupted chromic catgut, a flap of gastrohepatic omentum is sutured to the wall of the stomach to protect the site of the closure, and a gastro-enterostomy is done.

In duodenal ulcers only a puncture is necessary because the actual lesion is clearly in view and the ulcer crater usually small. So far, the cautery has been used chiefly for the bleeding type of ulcer of the duodenum; that is, the ulcer with a history of gastric or gastro-intestinal hæmorrhages. The perforation of such an ulcer with the cautery in addition to the routine gastro-enterostomy has apparently prevented the danger of subsequent hæmorrhage.

O. S. PROCTOR, M.D.

Bruett, H.: Radical or Conservative Operation For Freely Perforating Gastric and Duodenal Ulcer? (Radikale oder konservative Operation des frei perforierten Magen- und Duodenalgeschwüers?) *Zentralbl. f. Chir.*, 1921, xlviii, 1378.

In recent years the treatment of acute perforating ulcers and the chronic forms has become more radical. Von Haberer in 1919 was the first to report two cases of perforation treated by resection. The perforation had occurred seven and twenty-four hours previously. The patients recovered.

Bruett states that he does not use the radical method for all forms of ulcer. In cases of duodenal or pyloric ulcer gastro-enterostomy with exclusion of the pylorus remains the method of choice. In cases of acute perforation the results were not quite so satisfactory. Until a short time ago, over-and-over suturing of the perforation opening followed by a posterior gastro-enterostomy was the usual procedure. The abdominal cavity was then washed out and the wound closed by primary suture without drainage. In 140 cases treated in this manner the operative mortality was 40 per cent. Fifty-eight of the patients who lived were examined later; 47 per cent were entirely free from symptoms. In 12 per cent of the cases recurrence developed, and in five of these severe hæmorrhage occurred. Evidently gastric or gastrojejunal ulcers had been overlooked.

The frequent recurrence of ulcers led to the adoption of a more radical procedure whenever the patient's condition permitted. In order to justify the radical procedure in these cases it must of course be proved that the operative mortality is not much greater than that of conservative methods, and that the end-results are better. Regarding the first point the author reports on twelve resections in cases of perforation. With regard to the second point he is still unable to give a decision.

In ten cases there was an ulcer at the pylorus or in the duodenum. In most instances the perforation had occurred more than twelve hours previously. In eight cases there was beginning diffuse peritonitis. The author emphasizes particularly the fact that the abdomen was closed primarily in every in-

stance. The method of resection was almost always the Billroth II method.

Of ten patients operated on by this method, only one died following the operation. The pulse was rapid and hæmolytic streptococci were in the exudate. In this connection the author refers to the bacteriology of perforated ulcers. The variety of bacterium in the exudate is decisive as regards the prognosis.

In general, these cases of resection run a surprisingly smooth course. The method should be tried out in the larger clinics in order that it may be determined whether it gives as good or better results than the old method of over-and-over suturing.

KOCH (Z)

Hartmann: The Functioning of the Gastro-Enterostomy When the Pylorus Is Permeable (A propos du fonctionnement de la gastro-entérostomie en cas de perméabilité du pylore). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 1078.

Experimental work previously carried out by Hartmann demonstrated that the contents of the stomach were evacuated principally by the anastomotic opening when the latter was in the pyloric antrum, but by the pylorus when the anastomotic opening was in the cardiac portion of the stomach. The general opinion that in animals experimented upon the gastro-enterostomy orifice does not function when the pylorus is permeable is explained by the fact that in the dog the portion of the stomach presented when the abdomen is opened is the cardiac portion and hence almost always the orifice is made far from the pylorus. When the motility of the stomach is suppressed by section of the gastric nerves, evacuation occurs through the gastrojejunal orifice instead of through the normal pylorus, there being no longer any rhythmical contraction of the pyloric portion.

Hartmann urges surgeons making a study of the function of the gastro-enterostomy orifice in cases of permeable pylorus to indicate the situation of the new orifice exactly. The differences in the results obtained would then be explained.

In nineteen cases of gastro-enterostomy performed by Hartmann in which the pylorus was permeable it was found on re-examination from one to eleven years later that in one case complete evacuation occurred through the pylorus, in sixteen cases the gastric contents passed by the neostomy, and in two cases the stomach was emptied through both the pylorus and the neostomy. The difference was due to the different positions of the neostomy. When it is desired to obtain physiological exclusion of the pylorus and duodenum the neostomy should be placed in the pyloric antrum. W. A. BRENNAN.

Rankin, F. W., and Mayo, C. H.: Gastrojejunocolic Fistulæ Following Gastro-Enterostomy. *Surg. Clin. N. Am.*, 1921, i, 1241.

The seven cases of gastrojejunocolic fistulæ reported were observed among 101 gastrojejunal ulcers at the Mayo clinic.

Gastrojejunal fistulae have a definite syndrome and their presence can be revealed by the roentgen ray in practically all cases. The symptoms may begin from five weeks to nine and one-half years after a gastro-enterostomy. Usually they develop within six months or a year. The fistula may be intermittently patent and closed. The pain is not of a definite character, but is usually lower than that associated with duodenal ulcer. Often a palpable mass is produced by the scar tissue in the area involved. Diarrhoea, wasting, and faecal vomiting are prominent signs.

The cause of the condition is obscure. According to Moynihan, failures after gastro-enterostomy are due to three factors: (1) absence of a primary lesion, (2) a residual focus, and (3) a technical fault. Postoperative gastrojejunal ulcer occurs in from 1 to 3 per cent of cases of gastro-enterostomy, while in about 10 per cent of the cases of such ulcer a colonic fistula develops. Thirty-four cases have been reported previously in the literature. No definite etiological rôle can be assigned to trauma or mechanical factors. Non-absorbable sutures may be of some etiological importance, but jejunal ulcers sometimes follow the use of absorbable sutures. If infection is a factor, a nearby ulcer may be responsible, but infection may also come from a distant focus such as one in the teeth or appendix. The action of the acid gastric secretion on the jejunal mucosa and the suturing of the rent in the transverse mesocolon to the line of anastomosis are other possible causes.

Separation of the colon from the stomach with closure of the fistula and protection of the sutured areas by placing omentum between may be the only treatment necessary. It may be advisable to release the gastro-enterostomy and perform a Finney operation on the pylorus or to re-establish the gastro-enterostomy. In the thirty-one cases of fistula reported by Bolton and Trotter the mortality was not high considering the seriousness of the condition; of twenty-seven patients operated on twenty-one recovered. There was no operative death in the series of seven cases reviewed in this article.

J. W. Ross, M.D.

Mayo, W. J.: Gastro-Intestinal Union Following Gastrectomy for Cancer. *Surg., Gynec. & Obst.*, 1921, xxxiii, 578.

When Péan, in 1879, performed the first resection of the stomach for cancer, he was suddenly confronted with a surgical situation which he met brilliantly, but did not follow. Rydygier, in 1880, performed the second operation and apparently understood the principles involved. To Billroth belongs the credit for the performance of the first successful radical operation for cancer of the stomach. In his first method of resecting the stomach the continuity of the gastro-intestinal tract was restored by direct union of the duodenum with the amputated end of the stomach. The scope of this operation was limited because, if there was a con-

siderable gap between the end of the duodenum and the stump of the stomach, the tension was dangerous and frequently leaking would occur at the angle where the amputated end of the stomach was reduced to the size of the duodenum. In Billroth's second method these technical defects were overcome by a separate gastrojejunostomy after complete closure of the duodenum and the end of the stomach.

Kocher modified Billroth's first method by closing the end of the stomach completely and implanting the end of the duodenum into the posterior gastric wall. He tried to overcome the element of tension by mobilizing the upper duodenum, but his procedure proved to be open to the same objections as Billroth's first method and could be used only in cases in which the growth was small and close to the pylorus. The same objections applied to resection of the stomach in continuity for cancer. Pólya successfully modified the operation by closing the end of the duodenum, implanting the amputated end of the stomach into the side wall of the upper jejunum, and bringing the gastrojejunal anastomosis behind the colon through an opening in the transverse mesocolon. Neither the Pólya method nor Billroth's second method permitted attack on the more extensive growth of the stomach in which, after removal of the diseased portion, there was not sufficient room on the posterior wall for the independent gastro-enterostomy of Billroth's second method or sufficient length to bring the end-to-end anastomosis of Pólya below the transverse mesocolon. Balfour modified the Pólya operation by bringing the jejunum anterior to the colon, a change which permits the formation of a satisfactory anastomosis however small the portion of stomach remaining.

Moynihan has recently described a new operation in which the upper jejunum is divided, the distal end turned in, and the stump of the stomach applied end-to-end as in the Pólya method. The proximal jejunal end is then anastomosed to the lateral wall of the attached jejunum below the level of the transverse mesocolon.

Crile and Lilienthal advocate the two-stage operation: gastro-enterostomy first and removal of the diseased portion of the stomach some days later. A disadvantage of this procedure is that it necessitates the handling of the carcinoma of the stomach twice and therefore increases the danger of detaching cancer cells which may graft on the peritoneum, ruptured ovarian follicles, or lower sigmoid. Secondary resection does not always permit as careful removal of the glands as the primary operation. Mayo's experience with the two-stage operation has been very favorable regarding mortality, since practically all patients who survived the gastro-enterostomy and gained sufficiently to undergo resection recovered from the radical operation.

Peck has suggested that the gastro-enterostomy be made first in the cases of debilitated patients and that it should be followed by resection done imme-

diately if the patient's condition warrants it or performed at a second stage.

The roentgen ray and improved methods of clinical diagnosis are greatly increasing the number of patients with cancer of the stomach who come to the surgeon in a curable condition. Much of the success of the operation depends on the method of restoring the gastro-intestinal tract.

GEORGE H. JACKSON, JR., M.D.

Bacon, D. K., Anslow, R. E., and Eppler, H. H.: Intestinal Obstruction. *Arch. Surg.*, 1921, iii, 641.

The authors review the theories to explain the fundamental pathologic changes induced by intestinal obstruction. The theory of splanchnic paralysis and circulatory shock concedes a place of primary importance to the distension and consequent circulatory disturbance in the bowel and their effect on the sympathetic nervous system through the nerve endings in the wall of the intestine. According to another theory, water loss from drainage of the body fluid into the intestinal lumen above the obstruction is the cause of the systemic symptoms and eventual death. The latest, and at present the most widely accepted, theory attributes the symptoms to toxæmia of duodenal origin. Recent observations have led to the discovery that intestinal obstruction is frequently accompanied by remarkable changes in the concentration of the non-protein nitrogen of the blood.

The authors have undertaken experimental work on dogs to determine the influence, if any, of the water balance of the body on the progress of the condition and on the concentration and excretion of non-protein blood nitrogen. The findings of these investigations seemed to indicate that water deprivation is the most important, if not the sole, factor in the production of the pseudo-uræmia of intestinal obstruction. The conclusions drawn are as follows:

1. The rise of concentration in non-protein blood nitrogen observed in intestinal obstruction is due, not to that condition *per se*, but to the associated water loss.

2. An increase in blood nitrogen in intestinal obstruction may be prevented by the administration of sufficient water.

3. An increase of blood nitrogen may be produced experimentally in the absence of intestinal obstruction or a pre-existing nephritis by the adoption of any measure which will produce severe thirst.

4. In the absence of complications, death from intestinal obstruction is due to toxæmia from the protein disintegration which occurs after severe water loss. This is the most common clinical example of death from thirst.

5. The toxic nitrogenous residue is excreted by the intestinal mucosa from the blood stream into the intestine where it may exist in higher concentration than in the blood. If not drained out on relief

of the obstruction, the material may be re-absorbed by the lower bowel and colon and cause an increase of the already present toxæmia.

6. Fever in cases of intestinal obstruction may be of aseptic origin and indicate nothing more than the protein disintegration occurring in severe dehydration.

7. An increase in the non-coagulable blood nitrogen in various conditions such as heat stroke, peritonitis, pneumonia, and the atrophy of infancy depends on a low water reserve, and in the absence of nephritis may be used as a reliable guide for the administration of water.

8. The two chief theories of fever, the protein theory of Vaughan and the dehydration theory of Balcar, Sansum, and Woodyatt, may be unified by showing that the latter depends on the former.

FREDERICK CHRISTOPHER, M.D.

Stone, J. S.: Intussusception—The Clinical Manifestations. *Boston M. & S. J.*, 1921, clxxxv, 562.

The symptoms of intussusception are characteristic. The first is invariably paroxysmal and griping pain which occurs only during the periods of peristaltic action. Between the periods of contraction of the muscular wall of the bowel the child may often quietly drop off to sleep, but when the spasmodic peristaltic action comes on, definite signs of shock are produced by the violent contraction and pulling and squeezing of the bowel. Pallor, cold sweat, and often reflex vomiting occur during such periods.

The next symptom is the appearance of mucus in the stools. This usually occurs fairly promptly because of the active peristalsis and the fact that as a rule the trouble is located in the large intestine. It appears, however, only after the discharge of feces and may come at the end of an otherwise normal fecal movement. The mucus then is blood-stained. As the passive congestion increases, practically pure blood is poured out from the lower bowel.

The vomiting due to the intestinal obstruction is not the reflex vomiting noted at first and soon becomes fecal in character.

The toxæmia due to absorption is the next symptom, and in infants often comes on with appalling rapidity and severity.

Distention may or may not be present. Often it is slight because of the amount of vomiting, but at times it is considerable.

The diagnosis can be made from these symptoms alone. The finding of the tumor on examination of the abdomen confirms the diagnosis. As a rule the tumor can be felt with the greatest ease, but occasionally it is concealed behind distended loops of small bowel. Usually the condition begins at the ilioæcal valve. Therefore, at the onset the tumor is in the right iliac fossa. Very soon, however, the advancing mass is under the liver at the hepatic flexure of the colon, from which point it moves over toward the spleen and finally to the lower part of the abdomen on the left side.

In no condition are the symptoms more definite, and in none is the need of instant surgical intervention more plain.

No other than operative treatment is to be considered. However far to the left side the tumor may be felt, the incision must never be made to the left of the midline and usually may be well to the right because the greatest difficulty in reduction is usually met in the region of the cæcum. Reduction as far as possible by taxis is the first step.

If the bowel is gangrenous or if reduction cannot be effected, immediate resection is indicated.

After resection, anastomosis is necessarily a time-consuming procedure. In the cases of babies, enterostomy should be avoided if possible.

The appendix, the ileocæcal valve, and the various folds of serous membrane in this region are practically always involved in the intussusception. The temptation to remove the appendix is often strong. Surgical refinements should be left until later.

H. A. MCKNIGHT, M.D.

Hussey, F. V.: Acute Intussusception: Surgical Treatment and Report of Case. *Boston M. & S. J.*, 1921, clxxv, 564.

There is no medical treatment for intussusception. Inflation with air and distension with water are unscientific as they do not effect a positive reduction.

The surgical measures to be employed must be governed by the condition. Seventy per cent of all cases occur during the first year of life. In a series of 198 cases reported by Holt the mortality ranged from 37 per cent in those operated upon the first day to 75 per cent in those operated upon the sixth day.

As soon as the diagnosis is made, laparotomy is indicated. It should be borne in mind that when anything more than simple reduction of the intussusception is demanded, the risk is greatly increased. In a series of 374 cases treated at St. Thomas' Hospital 82.2 per cent of the invaginations were reducible. When the tumor is reducible a large part of the reduction can be accomplished within the abdomen. By gentle pressure at the apex and gentle stroking of the outer walls of the intussusception toward the apex the invagination is usually reduced easily except at the last portion. After complete reduction has been effected a search should be made for any abnormality, such as polypi, Meckel's diverticulum, or tumor of the wall of the intestine which may have been the cause of the trouble.

In a few cases the author has fastened the upper border of the terminal portion of the ileum to the inner margin of the ascending colon by a single suture of plain catgut or linen, making the two segments parallel.

The unreducible variety of intussusception presents a very different problem. In such cases resection is necessary. This may be done at a primary operation or delayed until the patient's condition has improved, the mass in the meantime being

anchored to the abdominal wall and the bowel drained proximally. Very few successful resections in children under one year of age have been reported, the mortality in such cases being nearly 100 per cent.

Resection *en masse* is preferable to the Maunsell-Barker operation as the former involves less exposure of the peritoneum to infection, it is an easier operation to perform, and it deals with more normal tissue.

H. A. MCKNIGHT, M.D.

Gallart Monés, F.: Primary Cancer of the Ampulla of Vater (Cáncer primitivo de la ampolla de Vater). *Arch. españ. de enferm. d. apar. digest.*, 1921, iv, 659.

The author reports the case of a man 50 years of age whose principal symptoms were pronounced emaciation, an intense icterus without itching, an increase in the size of the abdomen, free ascites, and œdema of the lower extremities. Between 15 and 20 liters of yellowish alkaline fluid were withdrawn by paracentesis. Below the floating ribs on the right side an indurated zone could be felt which suggested a neoplasm of the head of the pancreas. The Weber reaction was positive. There was entire absence of bile pigments and of amylolytic action. The Wohlgemuth test was positive. The diagnosis was primary cancer of the ampulla of Vater with probable invasion of the organs in the vicinity but no interference with the evacuation of pancreatic secretion.

At operation the common duct was found to be greatly dilated and full of a milky fluid. The gall-bladder was small. The cystic duct contained a nodule. The head of the pancreas was slightly enlarged and indurated.

The patient died twenty-four hours later. Autopsy showed a hard neoformation in the upper part of the head of the pancreas at the point of entrance of the common duct. Incision demonstrated the permeability of Wirsung's canal and the presence of small pancreatic cysts. Histologic examination showed cylindrical-celled epithelioma primary in the intestine with secondary invasion of the common duct and a tendency to invade the pancreas. A superficial histologic examination would have led to the erroneous diagnosis of a neoplasm primary in the head of the pancreas.

W. A. BRENNAN.

Biggs, M. H.: Intussusception of the Ileum in Adults Due to Benign Tumors. *Surg., Gynec. & Obst.*, 1921, xxxiii, 499.

One-third of all cases of intestinal obstruction are due to intussusception. The causes of intussusception, as reported in the literature, are diarrhœa, intestinal ulceration, benign and malignant growths, Meckel's diverticulum, intestinal parasites, heavy lifting, trauma, and purgatives. Treves states that polyps are present in 5 per cent of the cases. The benign tumors include the polypus, lipoma, myxadenoma, fibroma, myxofibroma, myofibroma, myxoma, cyst of the ileocæcal valve, and papilloma. Malignant growths are represented by carcinoma, sarcoma, myosarcoma, melanotic sarcoma, and epithelioma.

In the intestinal tract as a whole malignant growths cause one-seventh of the cases of intussusception, and benign tumors, one-fifth. In the large bowel the proportion is about equal, while in the small intestine the relation is two benign tumors to one malignant growth. Benign tumors do not alter the intestinal wall, but malignant growths render the bowel thicker, firmer, and less liable to infolding. Growths that project into the gut lumen are more apt to cause intussusception. Tumors in nearly any part of the intestines may be associated with intussusception: for example, a polypus at the pylorus and a tumor of the large bowel protruding from the anus. Every benign growth favors intussusception.

The course and symptoms of benign tumors are slight obturation, chronic stenosis, perhaps recurring intussusception (borne out by the history over a prolonged period and, at times, by the appearance of the bowel at operation), and finally complete obstruction. Early symptoms may be slight or absent. The onset may be sudden. The higher the tumor in the small bowel the later the symptoms develop because of the greater fluidity of the bowel contents. Recurrent invagination is characterized by colic-like pain and nausea followed by sudden relief.

Biggs reports the recovery of a man, 49 years of age, who had complete obstruction from intussusception of the ileum due to a myxoma. The intussusception was reduced. The broad base of the tumor necessitated enterectomy and intestinal anastomosis.

After reviewing the literature Biggs gives his conclusions as follows:

1. While intussusception is essentially a condition of childhood, it occurs in adults with sufficient frequency to make it of surgical importance.
2. Intussusception in childhood is usually spontaneous, but in adults a demonstrable lesion can usually be found.
3. The most common cause of intussusception in the small intestine in adults is a benign tumor.
4. A benign tumor can often be diagnosed before obstruction develops.
5. Recurrent invagination frequently occurs previous to obstruction.
6. After surgical reduction of intussusception a tumor must be sought for and, if present, must be removed if recurrence is to be prevented.

WALTER C. BURKET, M.D.

Joest, E.: The Pathogenesis of Intestinal Emphysema: Cystoid Pneumatosis of the Intestine (Einige Bemerkungen zur Pathogenese des Intestinal-emphysems: Pneumatosis cystoides intestini). *Arch. f. pathol. Anat.*, 1921, CCXXXIV, 524.

The pathogenesis of intestinal emphysema is not the same in man and the pig, as in man the pneumatosis of the intestinal wall may affect the colon as well as the small intestine, which is never the case in the pig. Moreover, the position of the visible

gas bubbles is also different as in man they occur only in the region of the mesenteric insertion.

The gas content of the cysts is not derived from the intestinal lumen, but must be attributed to the activity of the bacillus coli communis which is found in every intestine. The presence of inflammation of the intestinal mucosa or some other intestinal lesion and an abundant supply of carbohydrates are the main causes of this disease.

VOLLHARDT (Z).

Hayes, J. M.: The Involvement of the Lymph Glands in Carcinoma of the Large Intestine. *Minnesota Med.*, 1921, iv, 653.

A careful review of the literature is given with regard to the relative frequency of carcinoma of the large intestine, its origin and type, the frequency of metastasis, and the manner in which the malignant cells are disseminated.

One hundred preserved specimens which had been removed at operation in the Mayo Clinic were studied. Macroscopic and microscopic examinations were made of the primary growth and of the lymph glands, which were dissected out carefully. Special attention was paid to the location of the glands. Fourteen hundred and six glands were obtained from the 100 specimens. In 63 per cent there was no metastasis; in 37 per cent one or more glands were involved. The cases were divided into three groups, Group 1 including cases without metastatic involvement of the regional lymph glands, and Group 2 being made up of cases with metastatic involvement of one or more regional lymph glands. The third group was made of the cases of colloid carcinoma and divided into subgroups according to the presence or absence of glandular involvement.

Tables give the patients' sex, and age, the duration of the symptoms, the number of glands found, the number involved, etc. The data are briefly summarized as follows:

Carcinoma of the large intestine develops most frequently in the sixth decade of life, but is rather common after the third decade. It occurs with equal frequency in both sexes. Metastases are formed less often in carcinoma of the large intestine than in carcinoma of any other part of the gastrointestinal tract. In the series of cases reviewed, metastasis was found most often in the sigmoid flexure. The other parts of the large intestine were involved secondarily in the following order: descending colon, transverse colon, hepatic flexure, splenic flexure, and ascending colon. Carcinomata without local metastasis usually protrude into the intestinal lumen while those with local metastasis penetrate the walls of the intestine. Metastasis may occur in the liver without local metastasis.

Annular carcinoma is present in nearly 25 per cent of the cases. Annular constrictions due to degeneration and resulting scar tissue often have the appearance of annular carcinoma. Adenocarcinoma is present in every carcinoma which originates in the large intestine.

Colloid carcinoma occurs in 16 per cent of the cases and is of two types, viz., those with long duration of symptoms (the mildly malignant type), and those with short duration of symptoms (the highly malignant type). Colloid carcinoma metastasizes and is frequently present in the most highly malignant cases. It is very difficult to control after metastasis has occurred. The highest percentage of recurrences is found in the highly malignant type, in which local glands often show metastases.

Carcinoma of the large intestine frequently exhibits marked cell differentiation with a tendency to self limitation. Cases with little cell differentiation in the locally involved glands are clinically most malignant. The lymph glands may be palpable and plainly visible to the naked eye though normal in consistency. Lymph glands which are only inflamed may have such marked cellular infiltration and lymphœdema that they resemble large carcinomatous glands in size and consistency. Carcinoma usually enters the lymph glands at the periphery through the lymph sinuses. The lower cut-off ends of the glands in the intestinal wall may be mistaken for highly malignant cells. Very small non-palpable glands may be carcinomatous. The involved local glands are usually at the point of greatest extension of the growth.

Very few carcinomatous growths involve more than two or three glands in metastasis, but there may be many large inflamed glands in the same specimen. When a large number of local glands are involved the carcinoma is usually highly malignant. The size of the primary growth is no criterion of the presence or absence of metastasis. It is possible to rule out local metastasis in carcinoma of the large intestine only by a systematic microscopic examination.

MERLE R. HOON, M.D.

Mayo, W. J.: Diverticulitis of the Sigmoid. *Virginia M. Month.*, 1921, xlviii, 427.

Every medical practitioner has seen a case of diverticulitis of the sigmoid. This condition more often occurs in middle or later life and as a rule, but not always, in obese persons. In the active stage there is usually a painful, indefinite swelling on the left side of the abdomen. The symptoms are often subacute and accompanied by a moderate rise in the temperature, seldom above 102 degrees. In a few days, the pain, tenderness, and swelling subside, and in two or three weeks the patient recovers. However, not all cases have such a fortunate ending. Abscess formation may develop with spontaneous rupture, most frequently through the bladder. This may result in a permanent fistula between the sigmoid and bladder. In some cases distress in the bladder is extreme, due to the discharge of gas and feces with resulting infection.

Acute intestinal obstruction may be produced by adhesions caused by diverticulitis. When general peritonitis occurs as a sequel, the Ochsner treatment is carried out until the acute condition subsides to a chronic state.

Fistulæ between two portions of the intestine may occur and rarely heal spontaneously. Occasionally they lead to the formation of other abscesses which may rupture spontaneously with the formation of multiple fistulæ. The author has operated in his Clinic on a patient with as many as six intercommunicating intestinal fistulæ with one or more openings into the bladder.

A paper by Mayo, Wilson, and Giffin in 1907, with reports of clinical, operative, and pathologic findings in five cases of diverticulitis of the sigmoid, gave conclusive proof of the existence of this condition. Valuable contributions to the acute phases of the condition have been presented in the literature.

The author discusses only the acquired type of diverticulitis; that is, the type in which the mucous membrane pouts through defects in the submucous and muscular coats of the intestinal wall and is covered only by peritoneum. Congenital or true diverticula are covered by all the layers of intestinal wall. In the former the neck of the sac is smaller than the lumen, and as a result of infection and œdema the opening into the sigmoid becomes closed. The infectious process continues and localized peritonitis or abscess results.

Acute diverticulitis frequently simulates acute appendicitis. As a rule only one diverticulum is involved at the beginning, others being affected later through contiguity.

The X-ray has aided in the diagnosis of this condition and the demonstration of its frequency. Diverticulitis is not always confined to the sigmoid, although it is most frequently found in that portion of the intestine. Perirectal fistulæ may have their origin in an acute infection of a rectal diverticulum, as pointed out by C. H. Mayo. Diverticula may occur in any or all parts of the large intestine. Parts of the colon have been resected for diverticulitis in seventy-eight cases at the Mayo Clinic. In sixty-four of these cases the condition occurred in the sigmoid.

Chronic induration of a part of the sigmoid may follow the course of acute or subacute diverticulitis. This may produce partial or complete obstruction of the colon. It must be determined whether the tumor is chronic diverticulitis, carcinoma, or carcinoma developing on diverticulitis. Wilson, in 1911, called attention to the relationship between these conditions. Carcinoma occurred in four of the fifteen cases he reported.

The treatment of diverticulitis of the sigmoid depends on many factors. If the patient is a poor surgical risk it should be tentative. If an abscess forms we should not wait for it to rupture spontaneously but should evacuate it. Colostomy or cœcostomy may be necessary to relieve acute obstruction. The repair of an intestinal fistula resulting from diverticulitis is a serious problem calling for good surgical judgment and technique. In cases of chronic stenosis, resection and end-to-end anastomosis in one or two stages is indicated. The Balfour tube method is best for resection of the pelvic sig-

moid. The Mikulicz and Braun two-stage operations are often the safest methods of resection. Nearly one-third of the cancers of the sigmoid have originated in diverticulitis. Resection, therefore, should be done in the chronic tumor-forming type of diverticulitis. The mortality rate of this procedure is about the same as in cases of cancer of the rectum. Radical operation is to be considered seriously before it is advised.

MERLE R. MOON, M.D.

Bule, L. A.: A Safe Method of Removing Sigmoidal Polyps and High Rectal Polyps. *Med. Clin. N. Am.*, 1921, v, 419.

Polyps in the sigmoid and rectum are to be considered potentially malignant; therefore their removal becomes a matter of expediency. Small polyps and those with thin and relatively vascular pedicles can easily be removed through the proctoscope or sigmoidoscope by torsion, the snare, or the cautery. When the polyp is large and has a stout pedicle, hemostasis must be secured. For obvious reasons this has not been practicable through the proctoscope when the polyp was situated high. These cases usually demand laparotomy and sigmoidotomy with their attendant risk and discomfort.

The author describes an instrument constructed by Little of the Mayo Clinic which can be operated through the proctoscope for the successful removal of polyps from the sigmoid and rectum. This instrument, which is about 35 cm. in length, is composed of two crushing jaws operated by screw appliances on the end of a narrow tubular shaft. After thorough cleansing of the rectum, the patient is placed in the knee-chest posture, the proctoscope is inserted, and the polyp located. The clamp is then passed in with the jaws open, and with the aid of a special hook and fork, the pedicle of the polyp is drawn into the jaws of the clamp. By turning the screws on the end of the instrument the jaws are approximated and the pedicle crushed. The proctoscope is then removed and the clamp allowed to remain in position for twenty-four hours. During this time the patient must be kept in bed and not permitted to change his position without assistance as the handle of the clamp projects for a short distance from the anus and might easily be dislodged or damage the bowel. When the clamp is to be removed the screws are loosened to the limit, thus opening the jaws. Proctoscopic examination should then be made in order to ascertain the condition of the polyp. It will slough off in two or three days. During this time the patient should remain in bed.

The disadvantage of the instrument is that the handle projects from the anus; this has been overcome by a recent modification which permits the clamping end to be detached and remain in the rectum. The handle can be reapplied for its removal. The author reports three successful cases treated by the technique described.

V. G. BURDEN, M.D.

Pochhammer, C.: Sigmoid Anastomosis (*Zur Frage der Sigmoidoanastomose*). *Zentralbl. f. Chir.*, 1921, xlviii, 1343.

In this short article Pochhammer again advocates the method of sigmoid anastomosis in volvulus of the sigmoid flexure which he has previously urged. Neudoerfer's description of sigmoid anastomosis as a poor procedure for the treatment of volvulus of the flexure meets with his especial condemnation, particularly in view of the fact that Neudoerfer had operated by this method successfully in three cases.

Various failures with the procedure which have been reported in the literature seem to the author not sufficiently well proved to demonstrate its inadequacy or impracticability. He believes they are ascribable partly to the technique rather than to the method itself. He states that it is not a matter of inconsequence how the anastomosis of the stretched ends of the flexure is established. It is most important that they have the greatest possible extent and width in order that the contents may pass through unhindered. A considerable narrowing of the anastomosis must be reckoned with on account of the excessive stretching of the abdominal wall. It is of importance also to make the anastomotic opening in the region of the tænia opposite the insertion of the mesentery.

Primary resection in the treatment of volvulus Pochhammer believes is too dangerous, but he has recommended it as a secondary operation to patients who have first been given palliative treatment by anastomosis. Almost without exception, however, they have refused the recommended resection as unnecessary because they were free from symptoms.

DENCKS (Z).

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Mayo, W. J.: The Surgical Significance of Hepatic Incompetency. *Surg., Gynec. & Obst.*, 1921, xxxiii, 463.

The liver has long been recognized as a buffer between the general circulatory system and the gastro-intestinal tract, and between the general circulation and the spleen which filters from the blood micro-organisms and toxins it is unable to destroy and sends them through the portal circulation to the liver for destruction and detoxication. Little is known regarding the functions or the early pathologic changes of the liver; its concealed situation and its power of regenerating injured cells and forming new ones prevent knowledge of what is taking place in the earlier stages of hepatic disease.

Since all the liver cells are alike, the pathologic architecture in hepatic disease is simple. If the process is very acute, cell necrosis is manifest; if it is subacute, the destructive process assumes the nature of fatty metamorphosis; if it is chronic, cirrhosis is produced, the destroyed cells being replaced by connective tissue. If the cause of the hepatic cirrhosis is brought to the liver by the portal

circulation, the new connective tissue is deposited around the portal vessels and obstructs the delivery of blood from the portal circulation to the hepatic cells; the patient dies, not from hepatic insufficiency, but from the circulatory disturbances leading to ascites and gastro-intestinal hæmorrhages which are caused by the portal cirrhosis. In biliary cirrhosis the causes of injury to the hepatic cells are brought by the biliary channels or by the hepatic artery from some focal infection, and the connective tissue is deposited around the bile ducts where it obstructs the flow of bile, causing death from cholæmia.

The blood on which the liver acts is venous and leaves the liver as venous blood, oxygen playing little if any part in the changes which take place. While it is true that the hepatic artery furnishes some oxygen to the liver, the supply is not sufficient to lead to the belief that oxygen is necessary to its function, especially when a comparison is made between the relatively small arterial blood supply of the liver, which weighs from 50 to 55 oz., and the huge arterial supply of the spleen and kidneys, each of which weighs only a few ounces but uses a large amount of oxygen in functioning. As the hepatic artery gives off the gastroduodenal and supraduodenal arteries and branches to the pancreas, two-thirds of its volume is diverted before the liver is reached. Possibly one of the functions of the spleen is the removal of oxygen from the blood which enters the liver by this route. The functions of the liver are: (1) defense against invasion of the body by micro-organisms and the detoxication of toxic products brought to the liver by the portal circulation, (2) fat metabolism, (3) protein metabolism, (4) carbohydrate metabolism, and (5) bile function.

Amino acids in the body are developed in the liver from protein metabolism begun in the intestinal tract. Urea is the ash of protein burning. The liver is one of the great depots for fat deposit and is the converter of fat into consumable material for body use. Certain higher fatty acids, which may be a residue of improperly oxidized fats in combination with ash of improper protein burning, are back of many of the circulatory and vascular changes which lead to insufficiency of the vital organs, especially of the kidneys.

The end-stages of carbohydrate metabolism take place in the liver, and the distribution of sugar for the heat and the energy of the body takes place through the blood stream. There is normally between 0.07 and 0.11 per cent of sugar in the blood, and the ash of sugar oxidation is passed out of the body through the lungs as carbon dioxide. The considerable amounts of glycogen normally stored in the liver are fed more liberally into the blood stream under stress of the emotions, anger and fear, acting through the autonomic nervous system. Under such circumstances the utmost energy is obtained. In starvation, the stored glycogen is exhausted and the alkalinity of the blood reduced so that so-called acidosis is produced. The pernicious vomiting of

pregnancy is believed by Harding to be due to exhaustion of liver-stored glycogen, and the treatment of this condition by carbohydrate feeding seems to bear out this theory. Reduction of sugar below 0.07 per cent is usually accompanied by dehydration, and in the estimation of the blood sugar, which may appear to be normal because of the increased blood viscosity, allowance must be made for sufficient fluids to approximate normal conditions.

As Woodyatt has shown, the combustion of protein and the higher fatty acids is not complete unless a percentage of carbohydrate is burned in conjunction. Chronic bodily exhaustion is associated with disturbance of liver function and usually with diminution of sugar metabolism. The hepatic lobule has for its center a bile channel. The venous blood from the portal circulation is acted on by the hepatic cell and passes away in the plexus of the collecting hepatic veins; the refuse passes to the intestinal tract as bile. The fluids of the bile and certain constituents, such as the lipoids, are re-absorbed in the intestinal tract, while the pigments, containing the more active poisons of the biliary content, pass and are excreted. Bile is changed physically after it leaves the hepatic cell, additions being made to it from the biliary ducts. The bile which reaches the gall-bladder is concentrated and clear fluid is added. If it is retained for a length of time in the gall-bladder by an obstructed cystic duct, the biliary pigments are absorbed and a clear colloid fluid results, as is the case with bile in the ducts of the liver under similar conditions of obstruction. The retained bile pigments produce a fatty metamorphosis in the obstructed hepatic cells. When bile is obstructed in its passage into the intestinal tract, it is absorbed in the blood, the biliary pigments unite with the calcium in the blood, and in the course of a few weeks calcium exhaustion may occur. Reduction of the blood-calcium reserve lengthens coagulation time. The bile pigments are excreted from the blood by the kidneys. The cholæmia affects the tissue of the body as a whole, bringing about a pernicious dehydration, interfering with the sugar-forming function of the liver, and exhausting the sugar reserve. The secondary effects of cholæmia are felt by every organ of the body, especially the kidneys which are called on to excrete large amounts of bile pigments and other products of disturbed metabolism; renal as well as hepatic insufficiency may result.

Bell and Walters of the Mayo Clinic investigated cases of chronic jaundice in which operations had been performed for various conditions and death followed. They found that 53 per cent of the patients had blood in the peritoneal cavity, although not necessarily enough to account for their death. In comparable cases in which no jaundice was present there was only one case of intraperitoneal hæmorrhage caused by the slipping of a ligature on the cystic artery. In the jaundiced patients the blood was due to capillary hæmorrhage, and in no instance did the bleeding occur from demonstrable vessels.

Wright has shown that the loss of normal coagulation of the blood is due to calcium exhaustion, and that the calcium may be restored by giving calcium chloride. Calcium chloride given by way of the gastro-intestinal tract is absorbed slowly, if at all, by the stomach and intestines. It has been demonstrated by Lee and Vincent that its intravenous injection affects the coagulation time promptly, and Walters has shown that the coagulation time can be restored by the injection in from two to six hours and that the procedure is harmless. In cholæmia, however, calcium may not be the only factor in the tendency to bleed, and when calcium exhaustion has been remedied and coagulation time is still prolonged, transfusion of blood is indicated. Two important factors in counteracting cholæmia are the restoration of the normal blood sugar and liver glycogen, and the overcoming of the dehydration, thus aiding the kidney to eliminate bile pigments which are one of the chief causes of the general exhaustion. This may be accomplished by increasing the quantity of ingested carbohydrate and the fluid intake by mouth, by subcutaneous injections of glucose solution, or by the Murphy drip. No operative procedure which is not essential to immediate recovery should be undertaken in the presence of intense jaundice. G. H. JACKSON, JR., M.D.

Poppert, P.: The Importance of Infectious Cholangiolitis in Recurrences of Pain After Operation for Gall-Stones (Ueber die Bedeutung der infektiösen Cholangiolitis fuer die Entstehung der Schmerzrezidive nach der Gallensteinoperation). *Zentralbl. f. Chir.*, 1921, xlviii, 1342.

As a rule the cause of the recurrence of pain after operations on the bile ducts is a recurrence of stone, an ulcer or carcinoma overlooked at operation, stenosis of the common bile duct due to pancreatitis, or a cicatrizing decubitus ulcer. There remain, however, numerous cases in which these factors can be excluded. The pain is distinguished from that caused by adhesions by their colicky onset and their violence. Their duration varies. Icterus is rare. Fever is usually absent. In such cases the pain may be explained by a recurring infectious cholangiolitis, particularly if at the time of operation all the bile ducts were involved by the infection. Poppert recently succeeded in demonstrating bacteria in the tissue of the liver in such cases, and was persuaded that infectious, non-suppurative cholangiolitis is a very frequent complication of calculous and non-calculous cholecystitis. BERNARD (Z).

Crile, G. W.: The Technique of Gall-Bladder Surgery in the Presence of Jaundice. *Surg., Gynec. & Obst.*, 1921, xxxiii, 469.

The author points out that in jaundice cases the exhaustion is due to impairment of the internal respiration, particularly that of the brain and liver cells. Deep inhalation anæsthetics increase the operative risk because they further impair the internal respiration. In nitrous oxide-oxygen analgesia this inter-

ference is negligible and the sense of pain is reduced about 80 per cent, the balance being controlled by local anæsthesia.

To prevent further impairment of internal respiration, the author advises blood transfusion and the subcutaneous injection of large amounts of fluid either before or after the operation or at both times; the application of hot packs, especially to the region of the liver; and the avoidance of narcotics, such as morphine. His treatment is summarized as follows:

Before operation employ saline infusion, blood transfusion, and heat.

During operation employ analgesia, local anæsthesia, means to maintain the temperature of the liver, and decompression of the bile, but nothing more.

After operation employ blood transfusion, saline infusion (3,000 to 4,000 c.cm.), and heat to the liver, and obtain intermittent drainage of the bile.

Avoid deep inhalation anæsthesia, needless handling, the use of morphine, and doing too much. Decompress and no more. R. G. DOUTY, M.D.

Bircher, E.: Rare Cases of Cholelithiasis Surgically Treated (Seltene operative Kasuistik in der Behandlung der Gallensteinerkrankungen). *Schweiz. Rundschau. f. Med.*, 1921, xxi, 445.

An improvement in the results of operations for gall-stones is to be expected only when the indications for surgical treatment are appreciated earlier. The prognosis grows worse very rapidly as soon as complications set in, such, for example, as acute pyæmic infection with necrosis of the liver and the exceedingly frequent complications caused by diseases of other organs such as the stomach, pancreas, small intestine, and kidneys. Complicating conditions make operation extremely difficult from a technical point of view. If the general practitioner were always possessed of a correct knowledge of these processes, a point might be reached where the operation would be as ideal as that for appendicitis, particularly when the wound may be closed by primary union.

The author describes fourteen interesting cases, personally observed, which show the great variety of pictures that may be presented by cholelithiasis. The combination with diseases of the pancreas, which usually end fatally, demonstrates clearly the importance of early operation as the primary disease appears to be that of the gall-bladder. When pancreatitis has once set in, simple and prompt operation is demanded. Attention is called to the fact that a carcinoma of the gall-bladder may develop without giving rise to any symptoms of importance.

It is often difficult to make a sharp distinction between cholelithiasis and gastric diseases, and still more difficult to determine which of the two affections was the first. The condition most frequently accompanying cholelithiasis is splanchnoptosis which may bring about a kinking of the cystic duct. Operation is indicated, therefore, in cases of ptosis of the stomach, liver, or kidneys. The results are good

if it is not undertaken too late. Gastrorrhaphy is preferable to gastropexy because by the former it is possible to restore more natural conditions of function and form. The picture of ptosis may simulate the cachexia of carcinoma.

When cholelithiasis is accompanied by carcinoma of the stomach, operation becomes extensive and very difficult. Inflammatory processes in the duodenum may extend to the gall-bladder. Under all circumstances, early operation on the gall-bladder should be advised.

SCHUBERT (Z)

Balfour, D. C., and Ross, J. W.: Postoperative Biliary Fistulae. *Arch. Surg.*, 1921, iii, 582.

In a review of 166 cases of postoperative biliary fistula observed in the Mayo Clinic between January 1, 1910, and December 31, 1919, cholelithiasis was found to be the cause of the fistula in 85 per cent.

The relative merits of cholecystectomy and cholecystostomy must be considered in this regard. Of twelve postoperative fistulae (0.1 per cent) in 9,009 cases of primary operation on the biliary tract during the same ten-year period, there was only one in 5,997 cases of cholecystectomy, while eleven developed in 1,879 cases of cholecystostomy. The causes of the fistulae were found to be stricture of the common duct in the first instance, stones in the common duct in four, stones in the cystic duct in four, and recurrent cholecystitis in a residual gall-bladder in three. The danger of duct injury in cholecystectomy is therefore small as compared with that of the failure of cholecystostomy to remove a portion of the pathologic process.

In only two cases in the series reviewed was the cause of the fistula undetermined. This is a very small proportion, considering the difficulties which may be encountered in this type of case.

In no instance was it found that adhesion to a gauze drain or pressure from a tube was responsible. In one case, however, the formation of a permanent drainage tract was established by the prolonged use of a tube. Closure of the abdomen without any drainage whatsoever in 286 cholecystectomies in the Clinic during the past three years was without ill effect.

The period over which a fistula may drain varies greatly, but in the cases of retained stones and lesions of the gall-bladder the time is generally longer than in cases of malignant disease. A partial fistula of the intermittent type persisted in one instance for eleven years, but the longest period of drainage in a complete fistula was three years. No impairment of health other than anemia was found in the latter case. A drain had been in place for two years, and four stones, each about 3 cm. in diameter, were found in the common duct at the third operation. In other cases complete fistulae were present for twenty-one, eighteen, and twelve months.

The immediate operative mortality in cases of biliary fistulae is high (10 per cent) when compared with that of adequate primary operations on the biliary tract (1 to 2 per cent), but the reason is appar-

ent in the large proportion of patients with jaundice and the often septic nature of the operative field. In thirty-five cases of operation for stones in the cystic duct there were no deaths, while in only twenty-one cases of common duct injury there were six deaths.

Of the eighty-three living patients from whom information has been received eighty report that the fistula is closed and their general health is good. Twelve of these state that they have had occasional attacks of pain and jaundice.

Mayo, W. J.: Splenic Syndromes. *Surg. Clin. N. Am.*, 1921, i, 1307.

The most interesting of the splenic syndromes are those shown by the blood, and it would appear that the spleen is not the principal agent concerned in the pathologic conditions encountered, but rather the agent of destruction through which the damage is brought about. The author illustrates six splenic syndromes.

SPLENIC ANÆMIA

A man, aged 47 years, came to the Mayo Clinic March 15, 1921, complaining of a dull aching pain in the epigastrium, loss of weight, and anemia. Periods of debility were followed by great but temporary improvement. At the time of examination his condition was better than usual.

Examination revealed palpable cervical lymph nodes, prominent veins in the epigastrium, and an enlarged spleen reaching to the level of the umbilicus. Roentgenograms of the chest and stomach and both blood and spinal fluid Wassermann tests were negative. The hemoglobin was 72 per cent, the erythrocyte count 4.4 millions, and the leucocyte count 5,800. The differential count showed polynuclears 82 per cent, small lymphocytes 11.5 per cent, large lymphocytes 4.5 per cent, and eosinophiles 2 per cent.

On March 24, a greatly enlarged adherent spleen was removed. There was a moderate degree of cirrhosis of the liver (Fig. 1). Within three months after the operation the patient showed marked improvement, and at the end of six months, examination showed him to be normal in all respects.

SYPHILITIC SPLENIC ANÆMIA

A woman, 39 years of age, came to the Clinic August, 1921, complaining of progressive enlargement of the abdomen during the past two years. She gave a history of syphilitic infection some years before.

Examination revealed a very emaciated woman, slightly icteric, and with edema of the lower extremities. She was so ascitic that she was unable to walk without assistance. The spleen extended to the level of the umbilicus. The Wassermann reaction of the blood was strongly positive. The hemoglobin was 62 per cent, the erythrocyte count 4 million, and the leucocyte count 5,800. Despite her poor physical condition, she urged exploration and splenectomy.

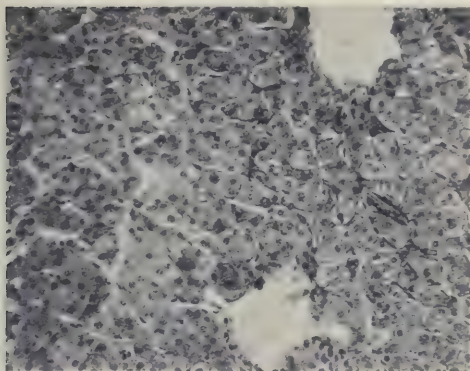


Fig. 1. Splenic anæmia; chronic cirrhosis of the liver with beginning atrophy of the cells (x100).

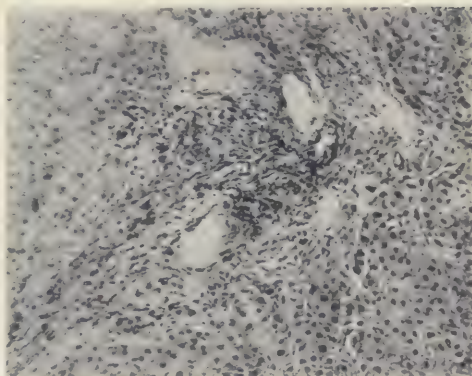


Fig. 2. Primary polycythæmia; peribiliary and perivascular cirrhosis of the liver with lymphocytic infiltration (x100).

At operation a markedly cirrhotic and nodular liver was found. It appeared to be about half the normal size, measuring 4 by 15 by 25 cm. About 12 liters of ascitic fluid were drained from the abdomen. The spleen, which weighed 950 gm. and showed marked venous engorgement, was also removed. After a stormy convalescence, the patient steadily improved for six weeks, but suddenly developed dyspnoea, passed rapidly into coma, and died. Autopsy revealed thrombosis of the portal vein, fat necrosis of the pancreas, and syphilitic cirrhosis of the liver with ascites.

PERNICIOUS ANÆMIA

A man, aged 39 years, sought consultation in March, 1921, because of weakness, epigastric distress, occasional tingling and numbness in the fingers and toes, and soreness of the tongue at intervals for four years. Other symptoms were palpitation, dyspnoea, and loss of weight.

Examination revealed a yellow skin, bald tongue, negative Wassermann reaction of the blood, achlorhydria, and a spleen 3 cm. below the costal margin. Neurologic examination gave evidence of an early combined sclerosis. Three transfusions had not resulted in permanent relief of symptoms. The hæmoglobin was 27 per cent, the erythrocyte count 1.02 million, and the leucocyte count 2,100. Nine normoblasts and moderate anisocytosis and poikilocytosis were noted in the blood smear.

In April, a large, adherent, dark-colored spleen resembling that of hæmolytic icterus and weighing 560 gm. was removed. When the patient returned home after the operation he gained 20 lbs. and his blood count improved markedly. The former symptoms returned, however, and he is now under treatment again.

Giffin and Szlapka have found that of fifty patients splenectomized at the Mayo Clinic in a period of four years, 21.3 per cent lived more than three years after the operation and 10.6 per cent lived more than five years. It would seem that the spleen,

while not the cause of pernicious anæmia, might be the destructive agent which sacrifices the red blood corpuscles which, though they are the best the organism can produce and are capable of function, are subnormal.

HÆMOLYTIC ICTERUS

A woman, aged 35 years, came to the Clinic in June, 1921, complaining of jaundice and a dull aching pain in the left side which had persisted for several years. Some jaundice had been present for five years, and for four years she had been subject to attacks of severe pain accompanied by nausea and emesis and followed by jaundice and the excretion of dark-colored urine.

The patient was poorly developed and deeply jaundiced; her spleen extended into the left iliac fossa and beyond the umbilicus. A roentgenogram of the stomach and the Wassermann test of the blood were negative. The hæmoglobin was 68 per cent, the erythrocyte count 3.12 millions, and the leucocyte count 8,800. Erythrocytic fragility was increased and the duodenal contents showed 24,000 units of urobilinogen and urobilin. At operation in July, an enlarged spleen weighing 775 gm. and a gall-bladder distended with stones were removed. Uneventful convalescence followed.

In thirty splenectomies for hæmolytic icterus at the Mayo Clinic there was only one death, that of a patient operated on during a crisis when the temperature was 102 degrees.

PRIMARY POLYCYTHÆMIA

A case of polycythæmia (rubra vera) was that of a man, 31 years of age, who had complained of severe epigastric pain for several months. Exploration was done elsewhere for gastric ulcer, but only a markedly enlarged spleen was found. About a week after operation the hæmoglobin was 106 per cent and the erythrocytes numbered 9 millions.

On examination the patient was found to be markedly erythrotic and to have a spleen reaching

to the midline and almost to the level of the umbilicus. Ophthalmoscopic examination revealed slight venous engorgement of the retinal vessels and hyperæmia of the nerve head. The erythrocytic fragility test was normal and the Wassermann reaction of the blood was negative. The hæmoglobin estimation by the Dare method was 92 per cent, the erythrocyte count 6.61 millions, and the leucocyte count 14,000. The patient was dismissed but kept under observation. Five months after he was first seen he had a severe hæmorrhage from the bowel and hæmatemesis, and a month later phlebitis of the calf of the right leg developed.

Three years after the first examination the spleen was removed. It weighed 900 gm. and was deeply buried in adhesions. A specimen of the liver removed showed peribiliary and perivascular cirrhosis (Fig. 2). No gross pathologic condition was found except in the spleen.

An uneventful convalescence followed and two months after the operation the patient was in excellent condition.

While it is believed that splenomegaly in polycythæmia is of no particular significance, this case suggests that the rôle of the spleen is greater than supposed, and that early in the disease the characteristic microscopic findings in other organs may not be present.

SPLENOMYELOGENOUS LEUKÆMIA

A woman, 34 years of age, who had noticed a mass in the upper left abdomen nine years before, was examined August, 1921. Eighteen roentgen-ray treatments during January and May, 1921, had resulted in some decrease in the size of the mass. She had lost 7 lbs. during the three months previous to examination at the Clinic, but no jaundice and no gastric symptoms were present.

Examination revealed pallor of the mucous membranes, bilateral pretibial œdema, a negative Wassermann reaction of the blood, and a slight increase in erythrocytic fragility. Splenic dullness extended from the fifth rib in the axillary line to the level of the umbilicus and 6.25 cm. to the right of the median line. The hæmoglobin was 46 per cent, the erythrocyte count 2.7 millions, and the leucocyte count 3,300. An occasional myelocyte was seen in the blood smear.

Splenectomy and cholecystectomy for gall-bladder disease were performed in September and convalescence was uneventful. The spleen, which weighed 2,360 gm., was lobulated and extensively adherent to the diaphragm.

Any reduction in the size of the spleen or the number of leucocytes improves the anæmia. Radium may be used pre-operatively to prepare patients for splenectomy, which can be done without difficulty when the leucocytes number less than 20,000. In a series of twenty-seven splenectomies for leukæmia there was one death. This was due to pulmonary thrombosis.

G. H. JACKSON, JR., M.D.

MISCELLANEOUS

Lockwood, A. L.: Subdiaphragmatic Abscess. *Surg., Gynec. & Obst.*, 1921, xxxiii, 502.

It is probable that the first description of subdiaphragmatic abscess was published by Barlow in 1845, but it was not until 1879 that the first operation was recorded by von Volkmann.

For practical purposes Barnard's description of the subphrenic space is probably the most complete. He divides the region on the under surface of the diaphragm into six areas, four intraperitoneal and two extraperitoneal. The four intraperitoneal spaces are separated and defined by the crusiform arrangement of the peritoneal folds or ligaments of the liver, namely, the falciform, the coronary, and the right and left lateral ligaments. The right extraperitoneal subphrenic space occupies the uncovered area between the layers of the coronary ligament as they are reflected onto the diaphragm, while the left is described as the area above the pole of the left kidney where the peritoneum reflects on the diaphragm.

The peritoneal cavity is further divided by the transverse colon into the supracolic and infracolic portions. The former is divided by the falciform ligament into a right and left portion, and these are again divided transversely by the coronary ligament and the right and left lateral ligaments to form four regions, the right and left anterior and posterior intraperitoneal regions. The author gives a detailed anatomical description of these regions, their boundaries, their contents, and the possible communication an abscess in any one region might have if adhesions did not prevent drainage. Because of its location and free connection with adjacent fossæ, an abscess is more prone to develop in the right anterior intraperitoneal space than in any other subphrenic area. This space is the only true subphrenic space on the right side.

The right posterior intraperitoneal space connects through the foramen of Winslow with the left posterior intraperitoneal space, but in the presence of inflammation this opening usually seals off early.

The left anterior intraperitoneal space occupies the so-called dome of the stomach's chamber, and an abscess in this area is often spoken of as perigastric or perisplenic. Adhesions of the anterior surface of the stomach and great omentum to the abdominal wall limit it below if an abscess forms. The boundaries of this space are extremely variable. It is the true subphrenic space on the left.

The left posterior intraperitoneal space is merely that contained in the lesser sac of the peritoneum. It is more descriptive to speak of an abscess in this space as an abscess of the lesser sac.

Subphrenic abscesses are due to many causes, and their location usually depends on the primary etiological factor. An abscess may result from direct infection or soiling, or from a pyogenic infection borne to the area from a focus elsewhere. Approximately two-thirds of such abscesses are the result

of soiling from a viscus within the abdomen, either before or following operation. One-sixth are the result of extension from adjacent abscesses, such as a perinephritic abscess, and one-sixth are due to distant foci of infection. A high percentage follow abdominal operations. Undoubtedly gravity plays an important part in the determination of the site. The author describes the possibilities in detail. The paracolic grooves in the female permit easier drainage into the pelvis and account for the fact that the incidence of subphrenic abscesses is lower in the female than in the male. Of 113 patients with subphrenic abscess observed in the Mayo Clinic 84 were males and 29 were females.

Subphrenic abscesses are due to the perforation of a hollow viscus within the abdomen, various lung and bone conditions, and distant foci of infection, such as carbuncles, cellulitis, etc. It is surprising that, with the suspensory ligament as the dividing line, so many abscesses on the left side are of appendiceal origin, occurring usually in a gangrenous, retrocaecal, or highly situated appendix. Only a few cases are due to extension from the thorax. The condition was primary in the thorax in only eighteen of 448 cases reported by Archibald.

Perforating ulcers of the lesser curvature and the posterior surface of the stomach tend to the formation of subphrenic abscess. Barnard reports seventy-six cases, twenty-one (27.62 per cent) of which were due to gastric ulcers, and five (6.5 per cent) to duodenal ulcer. Finkelstein reported 252 cases, sixty-seven (26.6 per cent) of which were due to lesions of the stomach. Of 100 cases in the Mayo Clinic three were due to carcinoma of the stomach, nine to gastric ulcer, and ten to duodenal ulcer.

Infection is spread to subphrenic areas by: (1) direct extension by gravitation from a general or localized peritonitis, (2) direct extension from the pelvic cavity, (3) the portal vein, (4) lymphatic extension, and (5) general infection through the blood stream.

The organism usually found in subphrenic abscess is the bacillus coli which frequently is associated with streptococci or various types of anaerobes. The content, however, varies with the etiology.

The pathologic process is infection, liquefaction, necrosis, and pus, the reaction forming a granulating protective tissue barrier. It requires about two weeks for the abscess to wall off; therefore earlier transpleural drainage should not be considered. A permanent fistula is rare. Gas is present in approximately one-third of the cases. The abscess may be unilocular or multilocular.

The symptoms of subphrenic abscess vary with the etiology, the location of the abscess, the patient's general resistance, and the onset of the disease, whether acute, insidious, or insidious with acute exacerbation.

The most common symptoms are varying degrees of fever and a corresponding increase in the pulse rate. The respiratory rate rarely follows the temperature curve. The temperature and pulse curves,

especially if associated with a chill, are practically always diagnostic of inflammation around the diaphragmatic level. Pain at the costal margin is referred also to the back and shoulder areas. The leucocyte count varies; occasionally a leucopœnia is found. Sweating and rigors occur. Often a short, catchy diaphragmatic cough is present, and occasionally there is dyspnoea. Vomiting and hiccough occur at some stage in 50 per cent of cases. Emaciation and loss of weight are progressive. Inspection in 60 per cent of cases reveals an anterior, lateral, or posterior bulging or mass at the transcostal plane. In early cases abdominothoracic movement is limited on the affected side and the interspaces directly over the abscess are frequently retracted. There may be limitation of diaphragmatic excursion, the liver may be pushed down, and occasionally pleural friction sounds are heard. At times it is possible to get a succussion splash.

Probably the most valuable aid in the diagnosis of subphrenic abscess is the roentgen ray. Even in the early cases the diaphragm may show a fairly characteristic irregularity. The differential diagnosis usually lies between pleurisy with effusion and abscess of the liver, but perinephritic abscess, hypernephroma, cysts, and aneurism of the lower thoracic or upper abdominal aorta must be considered.

A detailed description is given of the various points of bulging in relation to the subphrenic areas, and the usual type of pain. The febrile reaction is not so acute or the leucocyte count so high in the extraperitoneal types. The effect of the various types of abscess on the position of the liver is discussed in detail.

The abscess may resolve or burst into the lungs, pericardium, the stomach (from which its contents are vomited), the colon or duodenum (from which its contents are evacuated in the stool), or through the skin anteriorly; or it may perforate into the retroperitoneal tissue and burrow extensively, even reaching the posterior cul-de-sac in the pelvis. In less than one-third of the neglected cases it either resolves or opens spontaneously. Death occurs from toxæmia, general weakness, and inanition.

The prognosis, which must be guarded, depends on the deviation of the abscess, the etiology, the location, and the patient's general resistance. Death occurs in between 85 and 100 per cent of all cases not operated upon. Approximately 56 per cent of all reported cases operated on or not have been fatal, and from 23 to 40 per cent of those operated on. Autopsy findings show beyond a doubt that in the great majority of fatal cases in which operation was performed drainage was incomplete. Frequently a second abscess was overlooked.

The treatment of subphrenic abscess, when recognized, has been operation, either by the transpleural route or by abdominal incision. The two methods of operation and possible complications are discussed in full.

The patient is given one ampule of pantopon and scopolamin one and one-half hours before operation,

and one-half of an ampule of pantopon three-quarters of an hour later. Paravertebral anæsthesia induced with 1 per cent novocaine is used and the nerves are injected two spaces above and below the space to be incised.

The technique employed by the author for abscesses located on the right side is given in detail. The incision is planned for either the ninth, tenth, or eleventh intercostal space; the skin incision is 16 to 20 cm. long and directly over the interspace and the area of bulging, if present; otherwise it extends from the middle or posterior axillary line forward. This operation, as described, can be done in two stages. The author, however, considers it safe in the majority of cases to open the diaphragm at once.

Too frequent changing of the deep dressing should be avoided as it only destroys the granulation tissue and increases the temperature. Forced feeding, alkalization (120 gr. of sodium bicarbonate every twenty-four hours), glucose, and fresh air help to restore the patient.

The advantages of the operation are: (1) the avoidance of unnecessary mutilation, (2) free exposure, (3) minimal exposure of fresh tissue to re-infection, (4) no primary or secondary hæmorrhage from the intercostal vessels, and (5) the avoidance of prolonged and painful dressing of a superficial granulating surface.

From a comparative study of thirteen tables given the author draws the following conclusions:

1. Subphrenic abscess is a grave condition with a high mortality. The convalescence of patients who recover is long and tedious and accompanied by serious complications.

2. The serious sequelæ of the disease are due to the fact that the condition is not recognized sufficiently early or is not dealt with promptly and completely.

3. The condition is secondary to infection elsewhere, and in a high percentage of cases follows upper abdominal infection occurring at operation or postoperatively.

4. Gravity accounts for the involvement of subphrenic areas in the development of abscesses following abdominal soiling.

5. Every effort should be made to prevent soiling of the subphrenic area during abdominal operations, and drainage, particularly of the upper abdomen, should be employed only when absolutely necessary.

6. Subphrenic abscess should be suspected in all patients who, following abdominal operations, maintain for no obvious reason an elevation of temperature and pulse.

7. The roentgen rays should be employed as an early diagnostic aid.

8. Needling for diagnosis is a dangerous practice and should be used only to rule out pleural effusions.

9. More deliberate and protracted operations can be performed with minimal risk under paravertebral anæsthesia than under general anæsthesia.

10. A wide exposure of the abscess area is necessary.

11. Efficient drainage must be secured.

J. E. STRUTHERS, M.D.

Mixer, C. G.: The Surgical Aspects of Intra-Abdominal Tuberculosis in Infancy and Childhood. *Boston M. & S. J.*, 1921, clxxxv, 557.

The various types of tuberculosis within the abdomen appear to be different stages of the same pathologic process.

The most common avenue of infection is the intestinal tract.

When practicable in cases of mesenteric adenitis, excision of the tuberculous focus and correction of the cause of ileal stasis are indicated. Operation should be advised in any case of the ascitic type when improvement does not occur after a fair trial of medical treatment. Air injection may hasten the convalescence and show a lower mortality rate than simple laparotomy.

In the plastic type, operation is of no value except in the treatment of the complications of the disease.

Hygienic treatment is of paramount importance. Surgery should be used only as an adjunct and never to supplant it.

H. A. MCKNIGHT, M.D.

Masson, J. C., and Horgan, E. J.: Retroperitoneal Lipomata: Report of Twelve Cases. *Surg. Clin. N. Am.*, 1921, i, 1451.

The twelve cases of retroperitoneal lipoma reported in this article were operated on with removal of the tumor at the Mayo Clinic.

In a review of the literature it was found that most cases of retroperitoneal tumors are diagnosed only at operation. Even then, some of the growths have been thought malignant and inoperable. In most cases, however, they were removed when recognized.

The most striking fact regarding a retroperitoneal lipoma is the absence of symptoms due to it. In only four of the twelve cases in which the growth was degenerating were there acute symptoms with fever, making operation imperative. In the remainder the presence of the tumor, which was variously diagnosed as of renal origin, an ovarian cyst, etc., was the main indication for interference. Pain was severe in only one case and in this instance degeneration had occurred. Three patients had ascites, but none showed signs of obstruction. The loss of weight and strength was not of great significance.

The ages of the patients ranged from 40 to 72 years, the average being 55. There were five males and seven females. The average duration of symptoms was three years.

The tumor is usually ovoid and movable, with a multiglobular surface and a doughy consistency. Its position varies with its origin, but its source is usually the perirenal fat. It may, however, develop from any retroperitoneal fat, and in some instances may be palpable through the vagina or rectum.

The percentage of error in the diagnosis has always been high, even though such tumors have been known for many years.

The earliest case in which operation was reported was that of Lizars in 1824. Lizars had expected to find an ovarian tumor.

In the differential diagnosis it should be borne in mind that ovarian tumors are usually more tense and have not the doughy consistency of the lipoma. Pregnancy should be excluded by the history, and renal tumors by cystoscopic methods. The spleen is usually more firm and has a notch in its free border, but may be easily confused with a lipoma. In the majority of cases seen at the Mayo Clinic the true nature of the tumor was learned only at operation.

Fibromyomata and sarcomata are seen in the same situations. The former type of tumor is firm. Emaciation produced by a sarcoma of like size would be very evident. Lipomata may undergo sarcomatous change.

The cause of lipomata is not known. It was noted, however, that in two of these cases the tumor

developed in the perirenal fat after operations on the kidney.

Operation for removal of the growth may be very difficult if the tumor has displaced important vessels at the root of the mesentery, at the hilus of the kidney, or above the spine, and especially if degeneration has taken place.

The important consideration in choosing the incision is the attachment of the tumor and its relation to the blood supply. In cases of large growths a midline incision is indicated and an attempt should be made to remove the entire mass as recurrences are common. One patient was operated on four times and another twice. Postoperative obstruction, which is the sequel most to be feared, did not occur in the cases reviewed. There were two deaths, one due to abscess formation in the tumor prior to the operation and the other due to hæmorrhage from adhesions separated at operation.

The authors give a description of the histology, the clinical diagnosis, and the attachments, location, and weight of the tumor in the cases reported.

J. W. Ross, M.D.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Floercken, H.: Generalized Cystic Fibrous Osteitis (von Recklinghausen) with Particular Reference to Its Surgical Aspects (Ein Beitrag zur Ostitis fibrosa cystica generalisata (v. Recklinghausen) mit besonderer Berücksichtigung des chirurgisch-therapeutischen Verhaltens). *Med. Klin.*, 1921, xvii, 1171.

The patient was a married woman, 42 years of age, who had had no serious illnesses except influenza of medium severity in 1918. Her Wassermann test was negative. Examination showed an aneurism of the aorta with pulsation in the jugular vein. In October, 1919, a tender oval swelling 8 cm. long and 5 cm. wide made its appearance in the middle of the right tibia. Swelling and tenderness developed also in the trochanter major on the right side and the middle of the right radius. The X-ray at that time revealed large, thin-walled cysts on the right trochanter and the right tibia, and small cysts in the right radius and right ulna.

The cyst in the tibia was opened, the entire cyst wall removed with the exception of a narrow posterior ring, and a piece of the fibula of the other side implanted in the defect. The wound healed normally. A short time afterward a spontaneous fracture accompanied by extremely severe pain occurred in the region of the right trochanter. After treatment for a considerable period the patient was discharged with a sheath splint.

She then progressed fairly well until May, 1921, when, on raising herself in bed, she experienced a sudden, severe pain in the left shoulder. Examination showed a fracture of the arm at the surgical

neck. The arm was put in splints, but the pain did not cease. Operation at the site of the trouble a few days later exposed a cyst. This was drained, the cavity was curetted, and a thin strip from the tibia, with its periosteal covering, was riveted into the fracture. Since this operation the patient has been free from pain. In three weeks union was solid, and in four weeks the arm had full function.

In the middle of June, 1921, pain was felt in the left thigh. The roentgen picture revealed an extensive, irregular cyst formation from the trochanter downward. Following the application of extension apparatus the pain soon ceased.

Floercken raises the question whether surgical treatment is justified in a generalized osteitis fibrosa cystica, and if so, what should be done. He is inclined to the opinion that as a rule surgical treatment is not indicated and that only unbearable pain should lead us to open the cysts and relieve the internal pressure. If at the same time there is a fracture at a place of importance, riveting is to be recommended. For this, a strip from the tibia is sufficient. Transplantation of the fibula with its periosteum is not justified. Neither should resection with subsequent transplantation be done.

CREITE (Z).

Steinsleger, M.: Congenital Talipes of the Hand (Mano bot congénita). *Rev. méd. d. Rosario*, 1921, xi, 219.

The patient was a child 8 days old which had bilateral shortening of the forearm, absence of the thumb, and lateral deviation of the hand. The child's father showed the same deformity. There was no familial history of syphilis.

The anomalies are clearly seen in radiographs which accompany the article. Those of the father show, in addition, several minor skeletal irregularities in the elbow and carpal.

The condition described is rare. In 800 cases of congenital malformations of the hands recorded in the Centenario Hospital there were only three of club-hand, including the case here reported. The bilateral type is extremely rare. The generally accepted theory as to the etiology of the condition is that of Dareste which attributes it to amniotic bands. Such strictures produce pressure on the extremities of the embryo which in certain cases causes the disappearance of parts of the skeleton of the limb.

Congenital cases are exceptional. In the author's case and in cases reported by Bouvier and Roberts, however, heredity as an influence was clearly evident.

W. A. BRENNAN.

Calvé, J.: Osteochondritis of the Upper Extremity of the Femur. *J. Orthop. Surg.*, 1921, iii, 489.

Because of the dispute regarding the etiology of this affection and its obscure pathogenesis, its clinical manifestations are poorly defined and its evolution is almost entirely unknown. Most of the observations published are incomplete and show only one phase of the affection. This lack of information is due to the fact that osteochondritis is a rare condition and is found particularly among hospital patients, who are easily lost sight of. The author reports two cases which in his opinion illustrate all the other rare cases scattered throughout medical literature.

The first case was that of a child $3\frac{1}{2}$ years old who, in September, 1915, during the course of an attack of chicken pox, suffered slightly with pain in the right hip. X-ray plates showed the hip to be normal. Except for an occasional slight defect in walking, there was nothing to draw attention to the right hip until the end of 1916, when the child began to limp and complain of pain in the knee. Examination showed limitation of motion of the hip and a diagnosis of coxalgia was made. An X-ray examination revealed lesions characteristic of osteochondritis. The femoral head was in place but the clear articular space enlarged. The epiphyseal nucleus was changed in substance and was flattened and fragmented. Calvé saw the child for the first time in 1918, at which time the X-ray showed that the epiphyseal nucleus had increased in volume and formed a single, round, cup-shaped mass. Two and a half years later another X-ray examination showed the epiphyseal nucleus to be still larger and more regular in form, tending to approach the normal. Since 1918 the child has walked without fatigue and has led a normal life.

From these observations the author draws the following conclusions: (1) osteochondritis is not a congenital affection; (2) the phase of the invasion of the epiphyseal nucleus is latent from the clinical standpoint; (3) the clinical phase corresponding to

the period when the child first begins to complain of pain is considerably later than the true beginning of the trouble; (4) corresponding to the beginning of the clinical phase there is a radiographic picture showing an established and characteristic lesion; (5) the regeneration of the osseous epiphyseal nucleus occurs progressively as the osseous fragments increase in volume, approach each other, re-unite one by one, and finally form a single mass.

In the second case the interest lay chiefly in the examination of the different radiographs from year to year. At first there was entire absence of the epiphyseal osseous nucleus. Gradually it regenerated itself, at first fragmentarily. The important fact of this observation is that although the destruction of the epiphyseal osseous nucleus may be total, regeneration takes place and finally results in a voluminous epiphyseal nucleus.

These two observations show osteochondritis in a new light as a cyclic disease which begins in the first years of life and leaves after it an acquired malformation, a deformed articulation. The clinical signs, such as pain, do not show themselves during the inflammatory period of the affection, but appear only when the femoral head has become deformed in the course of regeneration. The femoral head, flattened and enlarged, is too large for the acetabular cavity and the pain is due to this fault of adaptation.

As opposed to the generally accepted theory that osteochondritis is an inflammatory condition, the author states that he believes it due to an acquired malformation. Under the influence of infection or traumatism, the femoral epiphysis is partially or totally destroyed. The osseous nucleus then begins to form in an irregular and atypical fashion, resulting in a more or less accentuated deformity of the cartilaginous epiphysis. The enlargement and flattening characteristic of the affection develops under the action of the body-weight.

Calvé believes the term "osteochondritis" is incorrect. He prefers the term "coxa plana" proposed by Waldenstorm. This term is short and makes clear the fact that the condition is an acquired articular malformation characterized by flattening of the upper femoral epiphysis.

LIONEL D. PRINCE, M.D.

FRACTURES AND DISLOCATIONS

Hartwell, J. A.: The Suspension Traction Treatment of Fractures of the Long Bones Near Large Joints. *Arch. Surg.*, 1921, iii, 595.

Suspension traction affords the best means of treating fractures of the long bones near large joints. It lends itself best also to the proper alignment of the distal fragments with the proximal fragment. In every fracture of a long bone two elements enter into the resulting deformity: either the proximal fragment is drawn from the planes of anatomical rest, while the distal fragment assumes this posi-

tion, or the distal fragment is drawn out of the proximal planes of the normally placed proximal fragment. Occasionally the two elements are combined. The surgeon has better control over the distal fragment. Therefore traction suspension aims to place the distal fragment so that it will be in proper relation to the proximal fragment. The author states that only exceptionally are fractures in the middle third of long bones treated unsuccessfully with the traction suspension method.

Every fracture is an emergency. In fractures of the femur, ice tongs are used with suspension. The immediate application of enough weight to overcome the shortening is very important. Too little pull results in fixation of the injured muscles in a shortened condition. In humeral fractures traction is obtained by means of adhesive or the Henniquen band around the flexed elbow. From 5 to 8 lbs. is sufficient.

Perfect anatomical repair of a bone with a crippled joint is more disturbing to the patient than poor position of the fragments and a joint that functions well.

In fracture of the femur below the tuberosities the upper fragment usually assumes a position of external rotation and abduction. However, the fracturing violence may cause an unusual position of the fragments. In determining the position of fragments dependence must be placed upon the roentgen ray. The author here cites a case of fracture of the femur 3 in. below the trochanters in which the upper end of the lower fragment was displaced inward and slightly forward but the upper fragment was also adducted and in normal rotation. An attempt to place such a fracture in proper alignment by abduction of the leg was unsuccessful.

Fractures about the shoulder joint show many similarities to those occurring in the upper end of the femur. In such injuries range of motion is all-important. Therefore in the treatment union must be obtained with the fragments so placed as to preclude joint obstruction.

The usual deformity resulting from a fracture through the surgical neck of the humerus is abduction and external rotation of the upper fragments. At times, however, as when the greater tuberosity is torn off, no means is at hand to influence the upper fragment. The humeral shaft can be so placed in proper abduction that the fragments are well aligned. Traction suspension treatment is ideal for such fractures.

Fractures of the femur near and involving the condyles are difficult. The typical supracondylar fracture with the lower fragment drawn directly backward can be easily drawn into proper alignment by placing the tongs sufficiently far back and high enough to draw the fragment forward.

The badly comminuted and displaced fractures involving the femoral condyles and the knee joint present unusual difficulties. As a rule moderate traction alone is needed. Here the author finds of value the use of the Steinmann pin through the

tibial head. After five weeks of such treatment the movable leg attachment to the splint is employed and active motion of the knee is begun.

The traction suspension treatment is used in badly comminuted or long spiral fractures of the tibia and fibula near the ankle joint. The tongs may be placed either in the malleoli or the os calcis.

The author concludes with the statement that the traction suspension method should be the standard in hospitals where any considerable number of fractures are treated.

JOHN MITCHELL, M.D.

Dubs, J.: Bilateral Symmetrical Luxation of the Clavicle in the Sternoclavicular Articulation. Bilateral Fracture of the Clavicle (Doppelseitige symmetrische Luxation der Schlüsselbeine im Sternoclaviculargelenk. Doppelseitige Schlüsselbeinbruch). *Schweiz. med. Wchnschr.*, 1921, li, 871.

The author's case of congenital bilateral anterior luxation of the sternal end of the clavicle is only the third which has been reported. The cause of the luxation, which develops gradually on a congenital basis, is entirely unknown. The condition has been observed only in youth; it is apparently under the influence of a chronically operating trauma which, with a congenitally stretched but abnormally relaxed capsular ligament, leads first to an incomplete and then to a complete unilateral or bilateral luxation.

Most therapeutic measures heretofore tried have not prevented a relapse. A definite cure has been effected only by Koenig's method—suture of the torn ligament and covering of the joint with a smooth osteoperiosteal flap reaching from the sternum to the clavicle—and Meyer's method—suture of the sternal and clavicular part of the pectoralis major muscle with its fascia to the sternal and clavicular aponeurotic insertion of the sternocleidomastoid muscle.

Dubs reports also a rare case of fracture of both clavicles.

GLAESSNER (Z).

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Goerres, H.: A Case of Painful Crepitation of the Scapula Cured by Operation (Ein Fall schmerzhafter Scapularkrachen durch Operation geheilt). *Deutsche med. Wchnschr.*, 1921, xlvii, 897.

The case reported was that of a patient 20 years of age who had had pain under the right scapula for five years. When the arm was raised posteriorly to the horizontal position so that the scapula approached the vertebral column a loud cracking sound was heard.

Conservative treatment brought no relief. An incision was therefore made along the inner margin of the scapula and the muscles separated. At the level of the fourth and fifth ribs the serratus posticus muscle was found to have undergone callous degeneration. Removal of the callus revealed angular flexion of the fourth and fifth ribs at this point and

a sharp-pointed exostosis the size of a pin-head at the vertex of the flexion. Extirpation of the callus, removal of the exostosis, and leveling of the eminence on the two ribs resulted in a complete cure.

JUENGLING (Z).

Mayer, L.: The Physiological Method of Tendon Transplantation. *Surg., Gynec. & Obst.*, 1921, xxxiii, 528.

The author shows that the gliding mechanism of the tendon is of the utmost physiological importance and its conservation is the first requisite in all tendon operations. Research has proved that the introduction of foreign bodies of any kind, such as vaseline and bismuth paste, favors rather than prevents adhesions. The preservation of the normal relationship between the tendon and its sheath preserves the normal gliding function of the tendon.

The tissue essential for tendon motion is the "paratenon," a loose, fatty meshwork rich in elastic fibers which surrounds the tendon on all sides. The tendon sheath is a closed sack containing fluid interposed between the tendon and the restraining fascial band or bone wherever the tendon changes its direction. This sheath is not present where the tendon runs a straight course.

The tension of a tendon varies directly with the strength of the muscle and the degree of contraction, but under anæsthesia when the origin of the muscle and the insertion of the tendon are brought as near together as possible the tension of all muscles is zero.

In tendon operations there must be absolute asepsis, and hæmorrhage and trauma must be reduced to the minimum. Whenever possible, the normal relationship between the tendon and sheath must be restored. The course of the tendon from its original site to that of the paralyzed tendon must run through tissue adapted to the gliding of the tendon. The normal insertion of the tendon must be imitated whenever possible by implanting the tendon directly into the bone or cartilage, preferably at the insertion of the paralyzed tendon. The normal tension and physiological length must be maintained. The line of traction of the transplanted tendon must be such as to enable it effectively to do the work of the paralyzed tendon.

The operations described are divided into four groups: (1) tendon transplantations or the transference of the tendon insertion; (2) true or "free" transplanting or grafting of a portion of tendon to fill in a gap between the retracted ends of a divided tendon; (3) tendolysis to free a tendon from adhesions and prevent their re-formation; (4) tendon suture for the repair of traumatic division of a tendon.

The author describes in detail the technique of tendon transfers for paralytic flat-foot, paralytic club-foot, paralytic cavus, paralysis of the extensors of the knee, and inoperable musculospiral paralysis, transference of the flexor sublimis tendon to replace the divided flexor tendons of an adjacent finger, and

transference of the extensor communis digitorum tendon of the index finger to replace the divided extensor tendon of the thumb, middle, ring, or little finger.

For free transplants, the palmaris longus or a portion of the flexor carpi radialis is used in operations on the hand, and the peroneus longus in operations on the foot. Atraumatic technique is particularly necessary in these grafting operations.

In tendolysis for adhesions of a tendon when its continuity is preserved the adhesions are separated and a transplant of fascia from the forearm is used to prevent recurrence of adhesions. To maintain the gliding function the gliding surface of the fascia is turned outward.

In the after-treatment proper exercise must be given at the proper time. In cases of foot transplants immobilization should not exceed three weeks, and in cases of finger transplants should not exceed two weeks. Immobilization should relax all tension on the structures operated on.

After the preliminary immobilization, active motion of the muscles should be begun. Passive motion and massage are of less importance. It is therefore unwise to operate on children who are too young to co-operate.

Adhesions form very rapidly after transplantation in the fingers. Hot water baths and small celluloid splints are useful.

The prognosis depends upon the type of operation. Transplantation of the peroneus longus or tibialis anticus from one side to the other has an excellent prognosis. Knee operations have not given as good results as foot operations, and hand operations are still less certain procedures because of the fact that the transplanted tendon is attached to tendon instead of bone. Tendolysis gives from 50 to 75 per cent normal motion. The success of the operation depends in great part upon the zeal and co-operation of the patient.

DANIEL H. LEVINTHAL, M.D.

Henderson, M. S.: Restoration of the Triceps Tendon by Transplantation of the Peroneus Longus. *J. Am. M. Ass.*, 1921, lxxvii, 1572.

The author reports two cases of free transplantation of the peroneus longus tendon to restore the triceps tendon. The peroneus longus is excellent for this purpose as a long piece of considerable strength may be obtained without disabling the foot.

In one case a suppurative process had destroyed the continuity of the triceps tendon. The other patient had suffered from a fracture of the olecranon process in which the proximal fragment had become adherent to the articular surface of the humerus. A gap in the triceps tendon was left by the removal of this fragment. The transplanted tendon was fixed proximally to the triceps tendon, interlaced, and firmly sutured. The distal end was divided, looped through a drill hole in the ulna, and sutured under tension with the arm extended. The results were satisfactory in both cases.

J. I. MITCHELL, M.D.

Sudhoff, W.: *Anatomical and Histological Examination of a Case of Mobilization of the Elbow Joint by Open Operation* (Anatomisch-histologische Untersuchung eines Falles von blutig mobilisiertem Ellbogengelenk). *Beitr. z. klin. Chir.*, 1921, cxxiii, 655.

This article is a detailed description of the anatomical and histological findings in an elbow which had been mobilized by Payr two years previously. There had been complete and partly bony ankylosis. A flap of fat and fascia from the thigh had been introduced. Function was perfect: active flexion to 45 degrees, active extension to 165 degrees. The patient died from influenza.

The articular space was clearly recognizable. The microscopic examination showed that the new capsular ligament had been formed from the periarticular tissue. Histologically, the sharp demarcation between the synovial membrane and the fibrous capsule was missing. On the articular surface was a tough, glistening, whitish layer consisting structurally of fibrous connective tissue which was hyaline in places and rich in cells but poorly vascularized; here were found cells which Schmerz has described as polyvalent formative cells.

In many areas the histological picture suggested cartilage regeneration. The formation of cartilage appeared to have had its origin sometimes in the marrow callus and sometimes in the periosteum. It is possible also that it arose from cartilage tissue left behind. The variation in the pictures presented in different areas seemed to indicate that the process of joint formation was not complete even after two years.

JUENGLING (Z).

Jones, R.: *Tendon Transplantation in Cases of Musculospiral Injuries Not Amenable to Suture*. *Am. J. Surg.*, 1921, xxxv, 333.

The war taught us that in cases of irreparable injury to the musculospiral and posterior interosseous nerves tendon transplantation is a most successful operation. Failure to obtain a perfect functional result was due to faulty technique or inadequate after-care. The operation should be performed only in cases in which the damage to the nerve or the muscles supplied by it is beyond repair.

The author allows twelve months to elapse after suture of the nerve before he considers muscle transplantation. In the treatment of paralysis due to a lesion of the musculospiral nerve tendon transplantation is always to be preferred to any operation of neuroplasty or nerve transplantation.

The object of tendon transplantation is to improve and restore muscle balance. Unless this is accomplished the operation is a failure. The transplanted tendon should be kept in relaxation; it should form a straight line from its origin to its insertion; it should be securely fixed in its new insertion; and it should not be expected to correct deformity or move a stiff joint.

Physiotherapeutic measures should be employed in order to insure mobilization of the fixed joint. Under

excessive tension, muscles become atrophied, while a tendon too slack delays restoration of function.

In injury of the musculospiral nerve above the origin of the posterior interosseous, the flexor carpi radialis should be inserted into the three extensors of the thumb and the extensor of the index finger. The three remaining finger extensors should receive the flexor carpi ulnaris.

Stiles has modified the operation by inserting the palmaris longus into the extensor secundi internodii pollicis and the flexor carpi radialis into the extensor primi internodii pollicis and the long abductor. The flexor carpi ulnaris he attaches to each of the extensor tendons.

The dissection should be clean and the tendons handled gently. The hand and fingers should be kept fully extended when the flexors are brought to the dorsum. The thumb should be extended and abducted. After operation the hand should be placed in a dorsiflexion splint with the wrist almost at right angles. The metacarpophalangeal joints should be slightly flexed to prevent stiffness. The hand should be kept in the splint continuously for two weeks, the splint then being removed daily for massage without changing the position of the hand.

This position of dorsiflexion should be maintained without interruption until the return of voluntary power. When dorsiflexion can be performed voluntarily with the fingers and the thumb extended the splint may be discarded. Stiffness will not occur if the fingers are kept slightly bent. Recovery is usually complete in from eight to ten weeks.

JOHN MITCHELL, M.D.

Lowenstein, K.: *The Physiological Functional Substitution of the Paralytic Quadriceps Femoris Muscle* (Ueber den physiologischen Ersatz der Function des paralytischen Quadriceps femoris). *Muenchen. med. Wchnschr.*, 1921, lxxviii, 1225.

In from three-quarters to four-fifths of all cases of paralysis of the lower extremities in children following poliomyelitis the quadriceps femoris muscle is involved. If compensation of the paralysis cannot be obtained by skillful balancing of the body weight, the continual danger of green-stick fracture is to be met by a plastic operation substituting for the quadriceps the flexors, biceps, and sartorius, or tensor fasciæ latae. The tensor fasciæ latae muscle does not possess very much strength for extending the leg since, by reason of its origin and insertion, its extending force is less when the limb is flexed at the hip than when it is extended. Spitzzy, however, achieved a good result in six recent cases with a quadriceps extensor plastic operation. The fact that extension of the knee joint can be obtained even in complete transverse fracture of the patella is due to the "lateral reserve extension apparatus"; of especial importance in this are the tractus iliotibialis with its radiations to the periosteum of the head of the fibula, to the fascia cruris, and to the periosteum of the tibia, the tensor fasciæ latae and the gluteus maximus.

The author reports the case of a 50-year-old patient with paralysis following poliomyelitis which involved the entire right lower extremity with exception of the adductors, the biceps, and small portions of the tibialis muscle. There appeared in the left lower extremity in the course of years a progressive flaccid paralysis of the tibialis anticus and the quadriceps femoris muscles. In spite of this condition the patient has a firm gait because of the marked hypertrophy of the tensor fasciæ latæ which supplies a physiological substitute for the quadriceps muscle.

PEIPER (Z).

Lamson, O. F.: Movable Bodies in the Knee Joint.
Surg., Gynec. & Obst., 1921, xxxiii, 490.

Rainey's theory as to the etiology of free joint bodies is that they are pieces of detached cartilage or cartilage and bone which continue to grow in a new locality and are independent of their source though adhering to their original character. Further studies have shown that they are nourished by the synovial fluid.

These osteocartilaginous bodies are most commonly found in the larger hinge joints, especially the knee which is peculiarly susceptible to injury because of its comparatively superficial location between the two longest bones in the body and the fact that it performs locomotion and weight-bearing from different angles. In extreme flexion of the knee joint, in which there is slight abduction with rotation of the leg on the thigh, trauma may cause nipping of cartilage and bone from the condylar surface of the femur, and the bodies so broken off may grow to considerable size. Undue pressure brought upon the tibia may cause detachment of small portions of the semilunar fibrocartilages, or the bodies may originate from the anterior and posterior fibrous horn of the semilunar cartilages. Joint villi may be rubbed off or become engaged in the joint, causing complete locking with severe pain.

The extensive synovial membrane lining the knee joint expands laterally at its patellar end to form wing-like fringes. This may become hypertrophied because of disease, infection, or chronic irritation and then undergo fibrous-tissue and calcareous formation. The osteocartilaginous fringes may be nipped off to form loose joint bodies through sudden movement. Villi or warty growths developing from the articular surface of the synovial membrane may also become liberated in the joint cavity. In the act of unlocking, the bodies may be crushed and increased in number until they are removed.

Robertson has observed that, after prolonged periods, certain areas of thickened synovial membrane develop into cartilage and bone which may act as foreign bodies. These areas may become pedunculated and eventually become detached within the joint. After having become fully detached they do not develop further.

In osteochondritis dissecans slight trauma causes detachment of a portion of the articular surface. The symptoms are usually intermittent locking of the knee joint in the flexed position accompanied by excruciating pain. This is followed by swelling and effusion into the joint. If the loose bodies are of considerable size they may become lodged in the suprapatellar pouch and hinder locomotion. Movable bodies may often be palpated by flexing and extending the knee joint, especially when they are situated in the suprapatellar pouch.

Stereoscopic X-ray observations are a great aid in making a positive diagnosis of loose cartilaginous bodies and in locating their relative positions in the joint. They cause well-defined uniform shadows of individual structure, whereas dislocated semilunar cartilages cannot be seen except when they are incrustated. Degenerated fat pads resulting from tuberculosis or syphilis may be palpated but are not revealed by the X-ray. A sesamoid bone in the internal head of the gastrocnemius may be mistaken for a loose body. Joint lipomata will not give the picture of joint mice but may cause locking and may be palpated.

Joint locking and pain are relieved by forced flexion followed by sudden extension which dislodges the offending loose body. Permanent relief is obtained only by surgical removal except in cases of arthritis deformans in which the operation is of little benefit as other loose bodies may develop, the causative lesion not being cured by surgery. The method of approach is dependent upon the location of the loose bodies in each case, and mobilization of the knee should be begun as soon as possible to prevent ankylosis.

The shape of joint bodies is usually plano-convex or concavo-convex. They may be found fixed in a depression in the articular surface of a femoral condyle or in the intracondylar space. Occasionally they may be pressed between the bones and lie in a fossa in the articular cartilage.

Joint mice are covered with a thick, shining, white layer of hyaline cartilage. Sometimes a thin layer of true spongy bone may be found on their smaller concave side.

RUDOLPH S. REICH, M.D.

SURGERY OF THE NERVOUS SYSTEM

Frazier, C. H.: The Achievements and Limitations of Neurological Surgery. *Arch. Surg.*, 1921, iii, 543.

Frazier reviews the advances made in neurological surgery and, while pointing out its limitations as they are known at the present time, is quite optimistic regarding future progress. With regard to

tumors of the brain he states that there is as much difference between an endothelioma and a glioma as between a gastric ulcer and an infiltrating carcinoma of the wall of the stomach. The former is a definitely encapsulated tumor which is readily accessible because it takes its origin from mem-

branes. In the latter, sharpness of definition is often lacking. By replacing normal brain tissue without adding to the volume of the cranial contents gliomata often grow to large dimensions before there are signs of intracranial pressure. Mere exploration in cases of glioma is attended with risk peculiar to this condition. Following the operation an œdema develops or hæmorrhage occurs in the tumor from a ruptured blood vessel.

The author mentions a group of cases in which the diagnosis of brain tumor was made but was not confirmed at operation; after the relief of pressure, the symptoms subsided. In all probability the underlying pathologic condition in these cases simulating tumor was a meningitis or leptomenigitis.

Subtemporal decompression has its widest application in cases without tumors and those in which the presence or location of a tumor is in doubt and the operation is employed as a procedure of temporary expedience.

In the major trigeminal neuralgias the operative mortality has been reduced from 5 per cent to less than 1 per cent. Frazier conserves the motor root and in so doing prevents atrophy of the temporal, masseter, and pterygoid muscles. With regard to the approach to the pituitary body he has revised his views since his paper describing the frontal approach in 1912. He is now of the opinion that when the lesion has extended well beyond the confines of the sella and is as much suprasellar as intrasellar, an adequate exposure and an attempt at radical removal are possible only by the intracranial approach.

In cases of tumors of the spinal cord the localization is more definite than in cases of brain tumors; therefore the former are more favorable for surgical intervention. Exploratory laminectomy should be done more often, even in the absence of definite symptoms of tumor.

At the present time surgery of the spinal roots for relief of spasticity is rather a formidable operation and its results have not as yet justified its general use. Chordotomy has been performed by the author six times for incessant pain. The operation is done by dividing the anterolateral columns 2.5 mm. in the transverse diameter and 2.5 mm. in the anteroposterior diameter.

General anæsthesia should be used in brain surgery. Autotransfusion of blood is advocated, and ventricular or subarachnoid puncture is advised in cases with increased intracranial pressure before operation.

H. A. McKNIGHT, M.D.

Platt, H.: *The Principles of the Surgery of the Peripheral Nerve Injuries of Warfare.* *J. Orthop. Surg.*, 1921, iii, 569.

This article is based on an experience with over 1,500 gunshot injuries of nerve trunks, including over 500 operations.

Physiological considerations show the importance of early suture in nerve lesions as a continued block

may destroy the regenerative power of the central cells and when operation is performed late it may interfere with the regenerative process after it is well along.

Since most of the larger nerve trunks have a more or less definite arrangement of bundles, longitudinal rotation must be prevented when the ends are approximated for suture. In cases of extensive gaps it is important to free the muscular branches of the main nerve trunk to facilitate the suturing. The necessary sacrifice of a branch or two may not cause any further disablement as some muscles have a double nerve supply. Although the extraneural blood supply is usually obliterated in the repair of nerve lesions, this seems to have no detrimental effect. The simple operation of neurolysis plays only a subordinate part in the repair of nerve lesions due to war missiles as the majority of such lesions are intraneural and not due to pressure or other extraneural conditions. Interstitial neuritis from general wound infection may complicate the lesion.

In the exploration of nerve injuries the following three points are of importance: (1) wide anatomical exposure; (2) direct electrical stimulation with a bipolar electrode; (3) a position of the limb minimizing the difficulties of end-to-end suture.

Statistics regarding results are compiled from 248 of the 510 cases operated upon. The eighteen bridging operations (grafts and tubulizations) were all failures. Recoveries of varying degree were noted in 79 per cent of the 150 cases of end-to-end suture. In the remaining 21 per cent the result was a complete failure. In 75 per cent of the eighty operations for neurolysis there was improvement or recovery but the author states that it is difficult to determine the exact influence of this operative procedure *per se* on the restoration of conductivity.

Factors which contributed to failure were: too long delay in operating; distal infection from necrosis of a part supplied by the nerve, especially the sciatic nerve; inexact topographical apposition due to longitudinal rotation; or attempts to suture two small trunks to a larger one.

In the discussion of this paper the salient points brought out are: the uselessness of nerve grafts and fascial tubulizations; the aid rendered by the use of a large magnifying glass in suturing of the nerve; and the working of surgeons in shifts so that the delicate anastomosing suture is done by an operator who has not been fatigued by the long dissection.

WILLIAM A. CLARK, M.D.

Malone, J. Y.: *A Method of Determining the Early Regeneration of Nerve Fibers at Operation.* *Arch. Surg.*, 1921, iii, 634.

The author quotes Lewis as stating that approximately 80 per cent of nerve injuries recover spontaneously. To discover the cases representing the 20 per cent in which interference will be necessary Malone proposes a test that may be made early in the convalescence.

When in the exploration of an injured nerve the nerve is found intact but thinned out or greatly thickened at some point, the question arises whether axis cylinders are passing through this area. If they are regenerating, the nerve should not be cut and resutured, but if they are not regenerating and sufficient time has elapsed for them to have grown through the suspected area, a secondary suture should be made.

The next question which presents itself is how it may be determined whether regeneration is occurring. To the author's knowledge, the only method used at present consists in stimulating the nerve trunk central to the lesion and noting whether there is any contraction of the muscles innervated by that nerve. Obviously, if regeneration were occurring but had reached only half the distance from the lesion to the muscles, no contraction would follow and one would proceed with the secondary suture. This would be harmful, not only because it would delay regeneration many months but also because regeneration following a secondary suture is not so promising as when the nerve is intact. The delay in regeneration and the harm done vary with the distance between the suture line and muscles innervated by the nerve tested and the distance the regenerating fibers had passed the point of injury.

It is a well known fact that when a peripheral nerve is stimulated by the application of cold to the skin of a human being or by direct stimulation of the trunk of an animal, there is reflex stimulation of respiration and blood pressure, and reflex contraction of muscles innervated by nerves other than the nerve stimulated. These phenomena are so well established and constant that the author felt they might be used as an index of regeneration when the nerve trunk was exposed at operation.

With this in mind he carried out a series of experiments on dogs. In each case the nerve was cut and repaired and then tested at varying intervals after the operation. The test consisted in stimulating the normal central portion of the nerve with a faradic current just strong enough for definite stimulation of the respiratory center. This strength of current was applied at varying distances distally from the suture line, and the central and peripheral effects recorded graphically or noted merely by inspection. The facts demonstrated by the study included the following:

1. Stimulation of a peripheral nerve (normal or regenerating) has such a definite effect on the respiration in animals and human beings that it is easy to observe the effect. Therefore a graphic record is unnecessary.

2. Reflex contractions of muscles which receive their nerve supply from normal nerves or from branches of the tested nerve leaving the main trunk of the nerve central to the lesion are of definite value in determining the presence of regenerating fibers.

3. Immediately after section and the resuturing of a nerve a threshold current spreads across the

suture line, but after a week this does not occur if the electrodes are placed more than 3 mm. from the suture line. After five weeks, when regenerating fibers have passed the suture line from $2\frac{1}{2}$ to 3 cm., a threshold current applied 2 cm. distal to the suture line causes a definite stimulation of respiration and reflex contraction of muscles. From this time on, the reflex effect on respiration is always present and can be elicited at increasingly greater distances distal to the suture line as regeneration progresses. Finally, when the regenerating axones reach the muscles, both their contractions and the central effect are present as in a normal nerve.

4. When the test is applied the anaesthesia should be so light that the corneal reflexes are very active as the test depends on the activity of the reflex arc.

5. The test is of no value in a pure motor nerve such as the facial, but is applicable to any sensory or mixed nerve.

6. The results in animal experiments indicate that the test is applicable to cases of peripheral nerve injury in man and should make a diagnosis possible weeks and months earlier than has been the case up to the present.

7. The test is of value, however, only after the fifth week following injury when the nerve is explored and found to be intact.

FREDERICK CHRISTOPHER, M.D.

Harris, R. I.: The Treatment of Irreparable Nerve Injuries. *Canadian M. Ass. J.*, 1924, XI, 833.

The experience of the war has proved that end-to-end suture is the ideal method of treating severed nerves. Unfortunately it is not always possible and not all nerves sutured in this way recover. Recoveries follow nerve suture in about 50 per cent of the cases. Nerve injuries of civil life recover more certainly, more quickly, and more completely than war injuries.

It is common knowledge that the successful outcome of nerve suture is modified by the nerve which is injured. Purely motor nerves, like the musculospiral, recover more certainly than mixed nerves like the median and ulnar. This must be due to our inability to match exactly the nerve pattern of the segments of mixed nerves.

The separation of nerve segments after suture is the result of suturing under too great tension, or imperfect fixation of the limb in a position which will prevent tension on the nerve. Both these causes can be prevented. End-to-end suture may be rendered possible in cases of relatively large gaps in nerves by flexing adjacent joints. The joints must be kept flexed for an adequate period of time. At the end of six weeks they may be extended a few degrees each week until full extension is reached.

From the examination of a number of sutured nerves which have failed to recover it appears certain that wrapping the site of the suture with fat, Cargile membrane, or other material is a cause of

failure. The presence of a sheath of vein, fat, or fascia about the site of suture results in increased fibrous tissue formation, and this, by constriction, presents a bar to the downward growth of fibrils. It is much better to displace the sutured nerve into a normal muscle plane than to wrap it.

Delay in uniting the ends of a divided nerve does not affect the prospect of success. As good functional results have been obtained from suture performed two or three years after the date of injury as from primary suture.

It is possible to improve irreparable nerve lesions by tendon transference. The brilliant results obtained in some situations suggest that the use of this method might be extended. The principle underlying tendon transference is the detachment of tendons which can be spared from normal muscle groups and their implantation into the paralyzed tendons. The author reports some very interesting cases illustrating this method. The article is summarized as follows:

1. A group of nerve injuries exist to which the term "irreparable" may well be given since they consist of: (1) sutured nerves which have failed to recover, and (2) nerve injuries in which end-to-end suturing is impossible.

2. A few cases in the first group have resulted from imperfect suture. Such cases should be re-explored and resutured if possible.

3. The remaining cases must be treated by secondary operations such as tendon transference and tendon fixation.

4. Irreparable injuries of the musculospiral nerve can be greatly improved by tendon transference.

5. Irreparable lesions of the median nerve may be improved by nerve anastomosis to relieve anesthesia and tendon transference to overcome paralysis.

6. Irreparable lesions of the sciatic nerve are treated better by stabilizing operations such as tendon fixation than by tendon transference.

FREDERICK CHRISTOPHER, M.D.

Nathan and Madier: Extensive Nerve Restoration by the Interposition of Loose Connective Tissue (Essai de restauration nerveuse étendue par interposition de tissu conjonctif lâche). *Bull. Acad. de méd., Par.*, 1921, lxxxvi, 243.

Nageotte was able to re-establish the continuity of a nerve by interposing between the two fragments a piece of nerve which had been preserved in alcohol. The authors have used loose connective tissue enveloped in an aponeurotic sheath. They state that a nerve is able to proliferate in young connective tissue despite an extensive gap between the proximal and distal ends. The two ends elongate and tend to meet.

Experimental work on dogs—section of the sciatic nerve and interposition of a graft of connective tissue—has shown:

1. That nerve fibers have traversed the 10 cm. of interposed connective tissue.

2. That the central and peripheral ends have proliferated simultaneously, one in a centrifugal, and the other in a centripetal direction.

3. That these two proliferations occur side by side, the continuity of the nerve being re-established by anastomosis of the fibers at several points.

4. That the nerve ends do not proliferate in adult connective tissue.

W. A. BRENNAN.

Shelden, W. D.: Tardy Paralysis of the Ulnar Nerve. *Med. Clin. N. Am.*, 1921, v, 499.

The author reports the case of a physician 31 years of age who complained of numbness along the ulnar nerve, weakness and atrophy of the small muscles of the hands, and inability to separate and close the fingers normally. When he was 5 years of age his right elbow had been fractured with displacement of the interior condyles downward and inward; this exposed the nerve on the apex of the displaced fragment so that since the accident it had been subject to traumatism. On examination the nerve was found to have a fusiform enlargement for about 5 cm. At operation it was brought anterior to the internal condyle. As a result it is moveable, its function has been improved, and atrophy and tenderness have almost disappeared. Twenty-two similar cases have been observed; fifteen were operated on.

The etiological factor in tardy paralysis of the ulnar nerve is deformity of the elbow joint such as fracture-dislocation in childhood, hypertrophic arthritis, foreign bodies in the joints, the development of bursa in the ulnar groove, and exostosis. The most frequent cause of the deformity is fracture-dislocation. This occurs on the average at the age of 7½ years, while the average age at which symptoms appear is 40. Tenderness and other sensory disturbances such as anesthesia to pain, temperature, and touch, are prominent symptoms. Remission of symptoms occurs in some cases and there is gradual progressive weakness with atrophy beginning in the small muscles of the hand.

At operation the nerve shows a spindle-shaped enlargement from one to three times its normal diameter. The nodules consist of thickening in the perineurium and connective tissue of the nerve. Electrical examinations usually show a partial reaction or degeneration.

The diagnosis is easily made if due consideration is given to the deformity of the elbow joint. Palpation of the nerve is important as in no other lesion except leprosy are such characteristic changes noted.

The treatment consists in rest and electricity, and if these fail, in the transference of the nerve anterior to the condyle. Because of the additional disturbance which may be produced, it is not well to resect a pseudoneuroma. The type of elbow injury, deformity symptoms, operative findings, and postoperative results in seven cases reported are shown in charts.

MERLE R. HOON, M.D.

MISCELLANEOUS

BLOOD

Lusena, M.: Experimental Study on Blood Transfusion (*Studio sperimentale sulla transfusione del sangue*). *Sperimentale*, 1921, lxxv, 461.

In a number of experiments Lusena found that, in general, the animals all reacted in the same way to the transfusion of their own blood removed a few minutes previously from the arterial circulation. The blood transfused varied in quantity from 10 to 20 c.cm. and was defibrinated.

A progressive decrease in the hæmoglobin and red cells was the common finding, but there was a difference in the resistance of the animals as some of them died while others slowly regenerated the destroyed elements. In two cases transfusion caused a temporary hyperglobulia. Citrated blood appeared to be tolerated better.

In the animals killed, macroscopic examination of the organs revealed nothing noteworthy. Microscopic examination of the hæmatopoietic organs showed the picture of the hæmolytic anæmia described by Banti.

If transfused blood lived again in the body from which, for a few minutes, it was removed, the development of anæmia would be proportionate to the quantity of blood not restored. The experiments demonstrated, however, that when once the blood is taken from the organism it does not again resume its vitality but causes toxic phenomena characterized by a decrease in the hæmoglobin and the red cells. The latter appear pale and sometimes consolidated and agglutinated. The number of cells is not constant; frequently it is a little increased after the transfusion. The fragility of the cells in the blood taken from the general circulation does not appear to be diminished. The changes enumerated vary in intensity. Some result fatally, while others vanish after a few days. W. A. BRENNAN.

BLOOD AND LYMPH VESSELS

Ott, W. O.: The Results of Twenty-One Cases of Surgical Treatment of Aneurism. *Ann. Surg.*, 1921, lxxiv, 513.

The author reports a thorough review of twenty-one cases of aneurism, exclusive of thoracic and cirroid aneurism, in which operation was done at the Mayo Clinic between January 1, 1907, and November 1, 1918.

Complete cures were obtained in thirteen cases. Three were obtained by proximal and distal ligation with excision of the sac in cases in which relatively unimportant arteries were involved. Four were proximal ligations only, three of the external carotid artery and one of the internal iliac artery. In one case a ligature was tied around the base of the sac. In three cases a Matas reconstruction endo-aneurismorrhaphy was done, in two for aneurism of the

popliteal artery and in one for aneurism of the femoral artery in Hunter's canal. In one case a compression suture was thrown around the communication in an arteriovenous aneurism, and in another the opening in the artery was sutured by opening the sac.

Improvement was obtained by a Matas obliteration operation in a case of popliteal aneurism, by proximal ligation in a case of aneurism of the common carotid, and by the proximal application of a Neff clamp in a case of aneurism of the common iliac. One patient was well for three years following proximal ligation of the subclavian aneurism and then had a sudden recurrence. There were three deaths in the series. One patient died from a cerebral embolus loosened by manipulation of the sac. Another death occurred from cerebral changes following ligation of the common carotid artery and internal jugular vein of a patient aged 66 years who had an arteriovenous aneurism between the common carotid artery and the cavernous sinus. A third patient died of circulatory disturbance following the application of a Neff clamp proximal to an aneurism of the common iliac artery.

In one case a residual circulatory disturbance characterized by numbness and formication in the foot persisted for eight months following the Matas operation on the popliteal artery.

The type of operation indicated depends largely on the location and type of the aneurism to be dealt with, and especially on the efficiency of the collateral circulation. Proximal ligation, proximal and distal ligation with or without excision of the sac and, in cases of arteriovenous aneurism, quadruple ligation were the most common procedures for vascular injuries in the recent war. In cases of traumatic and arteriovenous aneurism good results were obtained by proximal and distal ligation with excision of the sac, provided the vessels were small and their ligation did not disturb the peripheral circulation. In aneurism of the larger arteries, particularly the popliteal, femoral, and posterior tibial, the operation used must leave the lumen of the vessel intact. In some cases the base of the sac may be ligated. Passing an unabsorbable ligature about the point of anastomosis in arteriovenous aneurism may be done successfully as is illustrated by one of the reported cases. Ott believes that the most practical method of dealing with aneurisms of the larger vessels is some form of the Matas operation done with a constrictor applied proximal to the lesion.

The most successful method and the method of choice for aneurisms of small, unimportant arteries is proximal and distal ligation with excision of the sac. For large arteries it is some form of the Matas operation. The results of proximal ligation were uncertain. Gradual occlusion with clamps gave only indifferent or poor results.

L. D. MCGUIRE, M.D.

Harrigan, A. H.: Arterial Hæmatoma Following Traumatic Rupture of the Popliteal Artery.
Ann. Surg., 1921, lxxiv, 625.

The author reports the case of a patient who was injured by a fall three months previous to his admission to the hospital. A cystic, tense swelling in the lower half of the right thigh and more prominent over the internal aspect appeared immediately after the accident and slowly increased in size.

At operation a longitudinal incision was made over the most prominent part of the swelling. When the incision was deepened through the muscles of the thigh a cavity containing a large number of black and gangrenous blood clots was entered. The clots, compressed into definite laminae, formed a distinct wall to the cavity. An attempt to remove them caused a violent hæmorrhage. As the bleeding was clearly of arterial origin, the common femoral artery was immediately compressed in Scarpa's triangle and the incision rapidly enlarged. When the margins were held apart with retractors and the assistant released the pressure from the femoral artery an opening was detected on the inner wall of the beginning of the popliteal artery which was gray and somewhat necrotic. Double ligation of the artery effectively controlled the hæmorrhage. Two pieces of gauze were inserted in the wound for drainage and closure was effected with interrupted sutures. The color and warmth of the leg remained unchanged during the convalescence although pulsation of the dorsalis pedis artery was never perceptible.

The most efficacious treatment of arterial hæmatoma consists of early incision as the prompt evacuation of the clots favors the immediate restoration of the collateral circulation. Arteriorrhaphy is a feasible method of treatment. Ligation of the principal artery of an extremity should be avoided except as a last resort because, by suppressing many of the arterial branches, it favors gangrene. Whatever treatment is employed, drainage is absolutely essential, one important indication being the necessity of detecting the early onset of reactionary or secondary hæmorrhage.

Preliminary to ligation of a main artery an effort should be made to determine the efficiency of the collateral circulation, for it is evident that if this is not established, arteriorrhaphy or venous transplantation will be necessary to prevent gangrene.

FREDERICK CHRISTOPHER, M.D.

GENERAL BACTERIAL INFECTIONS

Leclerc: The Treatment of Septicæmia by Intravenous Injections of Peptone (Le traitement des états septicémiques par les injections intraveineuses de peptone). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 1122.

Leclerc reported a wound of the index finger which was followed by axillary abscess and then by septicæmia despite extensive incisions and free drainage of the abscess. The treatment then adopted consisted of daily injections of large doses of artificial

serum and camphorated oil. The septicæmia persisted, however, for a month. An injection of 1½ gm. of pure peptone dissolved in 30 c. cm. of sterile water was then made into the external saphenous vein. No reaction was observed, but from this moment the general condition rapidly improved.

It is not known how the peptone acts. Bazy, who submitted this report, stated that it causes a sort of expulsive phenomenon by which the organism rids itself of both the newly introduced substances and those which it already harbors. This mechanism would be somewhat analogous to the influence of intercurrent febrile maladies on the progress of dermatoses of chronic infections. According to Nolf, who has been particularly identified with treatment by peptone injections, the peptone effect can be produced by other substances such as bacterial, animal, or vegetable toxins. W. A. BRENNAN.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Aschner, P. W.: An Auscultatory Sign Observed in Acute Abdominal Diseases. *Am. J. M. Sc.*, 1921, clxii, 712.

In acute abdominal conditions with free pus, blood, or seropurulent exudation into the peritoneal cavity (most of them cases of appendicitis) the author has frequently noted with the stethoscope that the heart sounds and inspiratory murmur were audible over three or all abdominal quadrants, that the heart sounds were somewhat distant, suggesting fetal heart sounds, and that the inspiratory murmur was occasionally audible during quiet respiration and at other times only upon deep breathing.

These signs were not present in cases of slow accumulation of fluid, such as ascites, in which the parietes are stretched gradually, but appeared when there was a sudden accumulation of fluid under tension.

Aschner reports seventeen cases with positive auscultatory signs and positive findings at operation, twelve cases with negative auscultatory signs and negative findings at operation, four cases in which the heart sounds were heard in only one or in both upper quadrants, three cases with negative auscultatory signs and positive findings at operation, and two cases with positive auscultatory signs and negative findings at operation. WALTER C. BURKET, M.D.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Albanese, A.: The Changes in Transplanted Nerves and the Histologic Reactions They Produce in the Host (Sulle modificazioni dei nervi trapiantati e sulle reazioni istologiche che essi provocano nell'organismo dell'ospite). *Arch. ital. di chir.*, 1921, iv, 215.

Albanese has experimented with hetero-, homo-, and auto-transplantation of nerves in dogs and rabbits. In the hetero-transplantations he found:

1. Slow transformation of the lipoids from the medullary sheath of the nerve into neutral fats.

2. Rapid dropsical swelling of the axis cylinder which remained a long time in the grafted fragment in the form of fragments of abnormal thickness and necrotic appearance.

3. Disappearance of the nuclei of the sheath of Schwann which persisted as a mass of filaments deprived of definite organization giving the whole fragment of grafted nerve the appearance of a small necrotic mass, particularly when it was observed under low magnification.

4. Weak connective tissue proliferation of the host and hence its slow and scanty penetration into the mass of the transplanted nerve.

In the homo- and the auto-transplantations of nerves there were observed:

1. Active transformation of the lipoids of the medullary sheath into neutral fats and more rapid re-absorption of these than in the cases of hetero-transplantation.

2. Very rapid disappearance of the axis cylinders.

3. Persistence of the nuclei of Schwann's sheath even forty days after the grafting, and preservation of the normal appearance of the organized tissue.

4. Intense connective tissue proliferation of the host and rapid invasion of the fragment with connective tissue sproutings which tended to organize the fragment itself.

This varied behavior of the transplanted nerve and the tissues of the host is probably in agreement with the varied biological activity of the tissues of different animal species and dependent upon the fact that the tissues of one animal species possess properties which disturb the normal evolution of biological processes and necrobiosis in those of other species.

The article is supplemented by colored histologic plates.

W. A. BRENNAN.

Mann, F. C.: The Transplantation of Fat in the Peritoneal Cavity. *Surg. Clin. N. Am.*, 1921, i, 1465.

Fat has been transplanted into the peritoneal cavity for several purposes, the most important of which were: (1) to prevent adhesions, (2) to repair pathologic or surgical openings in the gastro-intestinal tract or ureter, (3) to strengthen a suture line of the gastro-intestinal tract or ureter, (4) to replace lost peritoneum, (5) to occlude a portion of the gastro-intestinal tract, and (6) to stop hæmorrhage. Since 1914, Bell, Harrington, and Kinsella have carried on independent series of experiments in the Mayo Clinic. For several years Mann has been conducting experiments in which fat has been used in connection with operations for various purposes; at necropsy note has been made regarding the prevention or production of adhesions by the transplanted fat.

The experimental work was done with two objects in view: the determination of the fate of the trans-

planted fat and the results produced, and the application of the procedure to clinical surgery. Williamson and Mann have called attention to the fact that it is difficult to standardize experimental procedures in the peritoneal cavity because of the marked individual variation in the reaction of the peritoneum.

Three series of experiments were carried out. In the first, free transplants of omentum were used in the peritoneal cavity; in the second, attached transplants of omentum; and in the third, subcutaneous fat. The results in the first and last series were practically identical. Fine silk was found to be the best suture material to hold the omental transplant as it produces the least reaction, but fine catgut carefully used is also satisfactory.

The conclusions based on a large number of observations made under various experimental conditions and following a varied technique were as follows:

1. Free omental transplants have a limited application in the surgery of the peritoneal cavity.

2. Free omental transplants may remain seemingly viable for one year, but as a rule are reduced in a few weeks to fat-free, scar-like tissue.

3. Free omental transplants may be used to prevent adhesions, but the value of the procedure is decreased by the fact that unless great care is exercised the results probably will be worse than if the transplants had not been used.

4. Free omental transplants are not safe for routine use in patching an opening in the gastro-intestinal tract.

5. Free omental transplants have little or no advantage in the reinforcement of the suture line of a gastro-intestinal anastomosis.

6. Free omental transplants can be used to replace lost peritoneum, but are not as good as sutures.

7. The gastro-intestinal tract can be occluded partially by a free omental transplant.

8. Free omental transplants packed into wounds of the liver, kidney, and spleen stop hæmorrhage from the wounds.

9. Attached omental transplants can be employed for many purposes, including those given. Their use, however, carries with it the potentiality of producing intestinal obstruction.

M. R. HOON, M.D.

Roeder, C. A.: The Relation of Surgical Technique to Gastrojejunal Ulcer. *Arch. Surg.*, 1921, iii, 622.

In the order of their frequency the position of ulcers developing after gastro-enterostomy is as follows: (1) in the jejunum close to the anastomosis; (2) along the edge of the anastomosis; (3) in the stomach close to the anastomosis; and (4) along the line of closure of a resected stomach. One noteworthy feature of the so-called gastrojejunal ulcers is that they are always found in proximity to the region of operative procedure, that is, along the suture line or about where a clamp was placed. In order to obtain hæmostasis in the thin jejunal

mesentery it is necessary to compress the thick jejunal walls with the intestinal clamp very severely.

In this article Roeder reports the results of gastro-enterostomies he performed upon dogs, employing a different technique in different cases and making careful autopsies. His conclusions he summarizes as follows:

1. The adjective "gastrojejunal" is used improperly to describe the type of ulcer following gastro-enterostomy as it does not designate the correct regional and relational occurrence of the lesion. Since these ulcers follow operation, the technique of surgical procedure should be more carefully studied.

2. The mucosa is the most important layer relative to chronic ulcer in any portion of the gastrointestinal tract. During operation it should be preserved to the utmost. Pre-operative and postoperative ulcers generally occur in areas where vascularity is comparatively decreased and the mucosa is less abundant.

3. The mucosa should be sutured separately and only along the very edge. In order to prevent scar-tissue infiltration and immobilization—the pre-ulcer condition—no other suture should ever penetrate this layer. Whenever possible, the mucosa should be dissected free from the muscularis, a measure which allows the outer coats also to be sutured separately with very little chance of including the mucosa.

FREDERICK CHRISTOPHER, M.D.

Schoenbauer, L., and Demel, R.: Experimental Research in Wound Drainage with Dry and Moist Dressings (Experimentelle Untersuchungen ueber Wunddrainage bei trockenem und feuchtem Verband). *Arch. f. klin. Chir.*, 1921, cxvi, 731.

The question which the authors set themselves to answer was how far drainage by rubber tube, iodoform gauze strips, or a wick favors the entrance of pathogenic bacteria into simple wounds or the larger hæmatomata when dry and wet dressings are used. For this purpose they shaved the backs of dogs, cleansed the skin with benzol iodide and alcohol, painted it twice with iodine, and then made transverse skin wounds 3 cm. in length. From the left margin of the wound a dressing forceps was pushed forward subcutaneously toward the abdominal region to a distance of 12 cm., and from the right corner of the wound a subcutaneous tunnel of the same length was formed with the shears. On the right side the soft parts were cut up as much as possible to cause the formation of a hæmatoma. Into each tunnel a long drainage tube or an iodoform gauze or cotton wick was introduced and the wound closed in the middle by suture. The vicinity of the wound was then smeared with pyocyaneus cultures and the wound covered with dry or moist dressings (thick layers of gauze soaked in aluminum acetate and covered with Billroth cambric).

Later, the abdominal surface was disinfected and punctured in order to examine the ends of the sub-

cutaneously draining tunnels, which here were 12 cm. from the wound. Previous examination of the skin had proved that the pyocyaneus bacillus was absent at the point of puncture.

When dry dressings were used the results of the puncture at the end of the wound canal without the hæmatoma were as follows:

Rubber drain: After twenty-four hours small quantities of pus with numerous pyocyaneus colonies (also gram-positive cocci). were found which, after periods of forty-eight and seventy-two hours, had increased still more.

Iodoform gauze strips: The secretion was more abundant than when the rubber drain was used, but bacteriological examination after twenty-four hours was negative for pyocyaneus, after fifty-two hours only a few colonies of gram-positive cocci were cultured, and after seventy-two and a hundred and twenty-four hours the result was entirely negative.

Wick drainage: The secretion was slight. The first puncture was bacteriologically negative and not until after a period of a hundred and fourteen hours were gram-positive cocci found in large numbers and pyocyaneus colonies in abundance.

In cases of dry dressings and hæmatoma the findings were as follows:

Rubber drain: Many pyocyaneus colonies were found after twenty-four hours.

Iodoform gauze: A scanty growth of pyocyaneus was obtained only when the third puncture was made after seventy-two hours.

Wick drainage: The first puncture after twenty-four hours was negative; the second after fifty-two hours gave a great number of colonies of pyocyaneus.

The results in cases of moist dressings and wound tunnels without hæmatoma were as follows:

Rubber drain: Large amounts of purulent secretion with many pyocyaneus rods after twenty-four hours.

Iodoform gauze: A small quantity of turbid secretion after twenty-four and forty-eight hours, more abundant after seventy-two hours, with scanty cultures at the beginning and still more scanty pus.

Wick drainage: Little secretion, which did not become abundant or purulent until after seventy-two hours; pyocyaneus absent; only a few gram-positive cocci were found.

In cases of moist dressings and hæmatoma the results were as follows:

Rubber drainage: After twenty-four hours there was much purulent secretion with many pyocyaneus bacilli.

Iodoform gauze and wick drainage: At no time was pyocyaneus found.

The same results were obtained when the tunnel wound was made horizontal and the site of puncture was not at the deepest point.

The authors conclude that the rubber drain favors the entrance of bacteria present on the skin, that iodoform gauze does the same, but in less degree,

and wick drainage opposes bacterial advance. In cases of gauze and wick drainage, moist dressings appear to retard the entrance of bacteria.

MARWEDEL (Z)

Carrel, A.: Cicatrization of Wounds. Factors Initiating Regeneration. *J. Exper. M.*, 1921, xxxiv, 425.

If regeneration is a direct consequence of the loss of tissue and is initiated by an internal factor, the cicatrization of a wound protected against all external irritation would take place normally. If this hypothesis is not true, the wound would not begin to cicatrize. It has been observed that the latent period of cicatrization of a wound dressed with dead connective tissue or plasma clot is abnormally prolonged. In order to ascertain the measure to which the onset of regeneration could be delayed by adequate protection of the surface of the wound, the author performed several experiments on dogs. In one instance the latent period lasted very much longer in the wound protected by connecting tissue than in the control wound.

It was found that as long as the wounds were protected against mechanical, chemical, and bacterial irritations by a connective-tissue dressing there was no evidence of cicatrization. The complete or partial failure of four of the author's experiments was due to the slipping of the inner dressing from the wound, mechanical irritation by the gauze, and infection. In two of the experiments in which the connective tissue was maintained at the surface of the wound cicatrization had not begun even at the end of twenty-five and eighteen days respectively after the operation, while in the control wound the duration of the latent period did not exceed five or six days. The experiments were interrupted after the second or third inspection on account of the technical impossibility of again applying a non-irritating dressing to the wounds but Carrel believes that the wounds could have been kept for a much longer time in a condition of quiescence.

While it is not known whether cicatrization can be prevented for an indefinite period, there is no doubt that if all external irritations are suppressed the mechanism of regeneration is not set in motion at the usual time. It appears, therefore, that under ordinary conditions cicatrization is not initiated by an internal factor.

On the contrary, the application of turpentine, chick-embryo pulp, and staphylococci markedly decreased the length of the latent period, often to less than two days. This fact demonstrated the importance of external factors in the initiation of cicatrization. It appears that the mechanism of regeneration becomes adapted to the ordinary conditions of life of the animals. A small wound will begin to cicatrize sooner if slightly infected, as is practically always the case, than if it is thoroughly protected by a non-irritating dressing.

The following are the conclusions drawn in the author's report:

1. It may be concluded that, under the conditions of the experiments, a wound protected by a non-irritating dressing shows no granulation tissue or beginning of contraction for at least twenty-five days.

2. The local application of certain irritants, such as turpentine, chick-embryo pulp, and staphylococci, reduces the duration of the latent period to less than two days.

3. Apparently regeneration is initiated, not by an internal, but by an external factor.

GEORGE E. BEILEY, M.D.

Fulle, G. B. C.: Experimental Research upon Wounds of the Gall-Bladder and Experimental Cholæmia (Contributo sperimentale alle ferite della cistifellea e alla colema sperimentale). *Arch. ital. di chir.*, 1921, iv, 229.

From a consideration of previous experimental work on the action of bile escaping into the peritoneal cavity, Fulle finds it evident that the question of cholæmia, which represents the final stage of biliary wounds with intraperitoneal biliary effusion, has not yet been completely answered. The majority of writers on the subject still speak of some poorly defined toxic action but do not know which of the different constituents of the bile is the toxic agent. Clinical results and experimental findings are too discordant to warrant the assumption that cholæmia is the sole cause of death following wounds of the liver and the biliary ducts as the death occurs a few hours after the injury although large quantities of bile can remain in the abdominal cavity for weeks without harmful effect. Some other condition, therefore, must be associated with the cholæmia.

To study this question further the author carried out a number of experiments on dogs and rabbits to determine the local action of the bile on the peritoneum. The flow of bile into the peritoneal cavity was effected by means of various types of wounds of the gall-bladder. All of the animals died when the wounds were severe, but some of those with slight wounds survived. The research included examination of the urine, the determination of the power of the peritoneum to absorb normal bile, and the determination of the toxicity of the intraperitoneal biliary effusion.

All animals having the fundus of the gall-bladder removed or with wounds 3 or 4 cm. in length died within a period of nineteen to sixty-two hours in the case of dogs and twelve hours to seven days in the case of rabbits. In dogs with smaller wounds, which were killed forty-two to sixty-five days after the injury, autopsy showed that the gall-bladder was surrounded by connective tissue adhesions and the peritoneal cavity was entirely normal, being free from adhesions and inflammation. These results agreed with those which were obtained from experimental intraperitoneal injections of ox bile in rabbits and demonstrate that normal bile is usually sterile.

An important finding which the author wishes to emphasize was that in extensive wounds of the gall-bladder little biliary pigment was found in the urine, while in cases of small wounds it was always present. In all cases there was complete absence of cutaneous and subconjunctival icterus. In the slight wounds reaction was manifested in the urine within twelve hours following the injury and persisted for a period varying from six to thirty-two days.

The experimental findings showed also that the normal bile collected directly from the gall-bladder of dogs and rabbits was undoubtedly more toxic than that which flowed from a traumatized gall-bladder and had had more or less contact with the peritoneal serosa. The bile flowing from large and fatal wounds of the gall-bladder was not more toxic than that flowing from small wounds which were not fatal. The author suggests that, by reason of its serous transudation, the peritoneum is bactericidal and can neutralize biliary toxins. However, as blood also is frequently present in these intraperitoneal effusions, the decrease in toxicity may be due to dilution of the bile by the blood serum or peritoneal exudate. This hypothesis, nevertheless, does not explain all cases as in many animals which died or were killed the bile found in the peritoneal cavity showed macroscopically all the characteristics of bile freshly derived from the gall-bladder. For further study the author therefore made intravenous injections of the intra-abdominal bile effusion. Most of the experimental animals died, but the period of survival was much longer than that following injections of normal bile. The longer survival indicated diminished toxicity of the bile in the effusion. In all these animals autopsy showed a moderate effusion of blood in the abdominal cavity which no doubt was due to the toxic action of the bile on the blood or the blood-vessel walls.

From his findings the author draws the conclusion that the danger of severe wounds of the gall-bladder is due to the immediate absorption of a greater quantity of the effusion which causes intoxication of the organism before the peritoneum can defend itself and arrests the processes of elimination.

W. A. BRENNAN.

Eisberg, H. B.: Experimental Intestinal Obstruction. *Ann. Surg.*, 1921, lxxiv, 584.

In the types of experimental intestinal obstruction discussed in this article the toxins seem to have a two-fold origin. In obstruction in the duodenal region due to severance of the gut the pancreas is probably the main source of the toxin. Bacteria are apparently not a determining factor.

In the pure segmental type of obstruction (i.e., an isolated segment, the continuity of the gut being uninterrupted) the damaged intestinal tissue is the deciding factor as regards a fatal outcome. If no devitalized tissue is present death does not occur. In non-devitalized segments bacteria alone will not cause a fatal outcome. In some cases devitalization

of a segment appears to be responsible for a fatal outcome long before there has been time for bacterial action to play a part in the result. When severance of the gut and segmental obstruction are both present but there is no damage to the intestinal mucosa in the segment, the fatal outcome is due to severed gut obstruction rather than to the undamaged segments.

In both types of obstruction the breaking down of the protein molecules of the host appears to be an important factor in the formation of toxic substances. Whether the actual end-products in both instances are chemically allied or not is yet to be proved.

In obstruction due to severance of the gut death appears to be essentially physiological. In the type due to devitalization of an intestinal segment this is true in the main but an additional element is the presence of bacteria. For the present, the character of the toxic product in the former can only be conjectured. In the latter the not clearly defined proteose or its split products may be regarded as the fatal agent.

FREDERICK CHRISTOPHER, M.D.

ROENTGENOLOGY AND RADIUM THERAPY

Wakeley, C. P. G.: Congenital Synostosis of the Radius and Ulna. *Arch. Radiol. & Electrotherapy*, 1921, xxvi, 185.

Congenital synostosis of the radius and ulna was formerly considered one of the rare deformities of the forearm bones, but since the introduction of the roentgen rays numerous instances have been reported.

In some of the cases, and especially those in which the synostosis is associated with dislocation of the head of the radius, a strong hereditary element is present. The main characteristic of the deformity is the fixation of both forearms in a position of pronation or mid-pronation. Extension and flexion at the elbow and movements at the wrist are always free. There is no movement of the radius and ulna, however, as between these bones there is firm osseous union. When the deformity is unilateral, the affected forearm often appears thinner and sometimes shorter than the sound arm.

Two types of the condition may be distinguished: (1) true radio-ulnar synostosis, and (2) radio-ulnar synostosis complicating congenital dislocation of the head of the radius.

In the true radio-ulnar synostosis the upper end of the radius is completely fused to the ulna for a distance of from 3 to 6 cm. The line of fusion extends obliquely downward on the front of the ulna, and the concave border of the bony arch corresponds to the upper end of the interosseous membrane. The lower ends of the radius and ulna are almost invariably free. In addition to bony union, the soft parts show considerable deviation from the normal. The supinator muscles are defective, and the pronator radii teres and pronator quadratus are much short-

ened. In over 80 per cent of the recorded cases of true radio-ulnar synostosis the condition was symmetrical.

To determine the etiological factors the author examined a considerable number of human embryos in various stages of development. He has come to the conclusion that, among other possibilities, the deformity might be due to failure of development of the supinators and pronators of the forearm. Several theories advanced by others, such as those ascribing it to abnormal pressure and atavism, are mentioned.

Brief reports of the eight cases which came under the author's observation are appended. Seven of them belonged to Type 1 and one to Type 2. Several photographs and roentgenograms illustrating the conditions are presented.

In cases in which the forearm is fixed in the semi-prone position operation is not advisable. In those in which it is fixed in the prone position an operation may be undertaken to separate the upper ends of the radius and ulna; the forearm should then be put up in the mid-prone position in which the disability is not so great. All operations on these cases are difficult because of the danger of injuring the posterior interosseous nerve. In fact, it is a question whether operation should be advised at all as the disability is usually very slight, the patient having adapted himself to the deformity.

ADOLPH HARTUNG, M.D.

Melville, S.: Some Points in the Diagnosis of Hilum Tuberculosis in the Adult by Means of the X-Rays. *Arch. Radiol. & Electrotherapy*, 1921, XXVI, 178.

There is great need for further investigation of the significance of abnormal shadows seen in the lungs and for their correlation with the clinical findings.

In about 90 per cent of all autopsies there is evidence of thickening of the root tissues and the presence of enlarged, and sometimes calcareous glands or peribronchial thickening.

Radiographic evidence of obviously tuberculous adenitis of the mediastinal and bronchial glands is very common in children.

Chronic interstitial pneumonia results in the formation of a great deal of fibrous tissue around the bronchial tubes.

Chronic bronchitis gives rise to an increase in the amount and density of the shadows of the bronchial tissue.

In emphysema the shadow of the bronchial tree stands out in marked contrast to the surrounding hypertranslucent lung and consequently appears to be denser than normal.

Hilum tuberculosis, therefore, cannot be included with any of these conditions, in all of which there is exaggeration not only of the hilum shadow but also of the peribronchial shadows. The only exceptions are direct hilum infection in children and certain cases of known tuberculous origin.

Hilum tuberculosis is a definite affection which is recognized by many able clinicians. Among the latter are Rivière and Beddard. It appears that Rivière bases his diagnosis on the symptoms, the presence of certain areas of paravertebral dullness, and the transverse narrowing of the apical expansion, but chiefly the fact that the affection is bilateral.

In the X-ray picture the cardiac shadow is generally small and vertical in position, the left border of the heart being internal to the root of the left lung and thus leaving the latter uncovered. The roots of both lungs show thickening and increased density, such thickening being of the soft or "woolly" type or showing definite and discrete nodules (calcareous glands). Marked narrowing and lessened expansion are noted at the apices of both lungs. It is to the latter point that particular attention is directed.

ADOLPH HARTUNG, M.D.

Carman, R. D.: Primary Cancer of the Lung from the Roentgenological Viewpoint. *Med. Clin. N. Am.*, 1921, V, 307.

The author reports thirty-seven cases of primary cancer of the lung. In seventeen, the roentgenological findings were verified by autopsy. Cancer was found in seven of ten cases in which biopsy was made. In the three others and in ten additional cases the diagnosis was supported by clinical and roentgenological evidence. Twenty-nine of the patients in this series were men and seven were women. The average age was 50 years. The youngest patient in whom the diagnosis was confirmed by autopsy was 17 years old.

The cases are classified as lobar (14) and hilar (23). In twelve cases of lobar cancer the primary growth cast a massive shadow, and in six cases the larger shadow was associated with smaller shadows (metastatic areas). In seven cases the shadows were in an upper or middle lobe, and in five, in a lower lobe. In two cases small diffuse shadows in both lung fields showed the condition to be miliary in type. In seven cases of hilar cancer the margins were rounded and circumscribed, and in the remaining sixteen cases they were hazy or irregular with prong-like projections.

The lobar shadow is often extensive and may involve more than one lobe. The shadows usually are markedly dense and homogeneous, though their peripheries may show a hazy thinning out.

In both cases of the miliary variety the metastases were roentgenologically of the miliary type. In the absence of an extrathoracic primary growth it is best to assume that the innumerable small nodules are metastases from some undiscovered focus, either at the root or elsewhere in the lung.

The clinical symptoms of primary cancer of the lung are not pathognomonic and the condition is often confounded with other lesions, especially with tuberculosis. The roentgen-ray signs, however, may be characteristic. The extensive and dense lobar shadow associated with smaller shadows of metas-

tasis is pathognomonic. If the latter are not present, carcinoma may be only suspected. Its presence should be considered also when a dense shadow, variable in size, with a convex outer border and with either smooth or irregular margins is seen at the hilus. Complicating factors, such as congestion, atelectasis, and effusion, often render the interpretation of the roentgenograms more difficult. Although cavities were found in the postmortem examination in three cases, they were filled with débris and had not appeared as cavities on the plate.

Except the type regarded as pathognomonic, all varieties of primary cancer of the lung require careful interpretation in the light of the clinical facts.

CHARLES H. HEACOCK, M.D.

Eusterman, G. B.: A Case of Delayed Postoperative Obstruction of the Proximal Loop of the Jejunum from Adhesions, and a Description of the Attendant Phenomena Including Gastric Tetany: Discussion of the Discrepancy Between Clinical and Roentgen-Ray Observations on Motor Function. *Med. Clin. N. Am.*, 1921, v, 395.

Eusterman reports two cases of unusual interest. The first was that of a woman, aged 31, who had delayed postoperative obstruction of the proximal loop of the jejunum due to adhesions and gastric tetany. Previous to the author's study of the case a posterior gastrojejunostomy had been done elsewhere on a diagnosis made by a roentgenologist. Three months after the operation the symptoms of high intestinal obstruction developed.

Examination at the Mayo Clinic elicited no ante-operative history suggesting ulcer, but rather that of a severe migraine of long standing. A moderate six-hour barium retention was present but the stoma could not be seen. There was no evidence of an ulcer either in the duodenal cap or the body of the stomach. Under further observation in the hospital there was definite clinical evidence of low duodenal obstruction which was confirmed by the motor test-meal, regurgitant vomiting, and visible gastric peristalsis. A second fluoroscopic examination showed no sign of barium retention and did not reveal the stoma. A severe attack of gastric tetany was precipitated, but subsided promptly under treatment.

In summarizing, the author briefly discusses the following points of interest:

1. The growing tendency among many surgeons to perform operations on insufficient evidence.

2. The late postoperative development of severe symptoms of obstruction unlike the pre-operative complaint. In this case the ordinary test meal was a better criterion of motor derangement than the barium meal. This is not uncommon in the presence of marked hypersecretion or excess fluid.

3. Inability of the radiologist to visualize the gastro-enterostomy opening. This may have been due to failure to perform the gastro-enterostomy, to intermittent spastic closure, complete cicatricial contraction of the stoma due to a gastrojejunal ulcer,

or to obstruction of the proximal or distal jejunal loop, which usually is the result of technical error.

A diagnosis was made of non-ulcerative post-surgical obstruction at or just below the stoma, with gastrectasia. Operation revealed a dilated stomach, an open pylorus, no evidence of ulcer in either the stomach or duodenum, and a gastro-enterostomy opening admitting three fingers. The jejunum had been applied in the wrong direction and adhesions were producing marked angulation of the proximal loop. An entero-anastomosis was made and the patient recovered.

The second case was that of a man, aged 49 years, who had a chronic penetrating gastric ulcer which apparently had developed after a successful gastro-jejunostomy five years previously for an obstructing duodenal ulcer involving the pylorus. The patient had enjoyed good health for three months after this operation. At the end of that time, following an attack of acute gastro-enteritis, progressive epigastric symptoms quite similar to those of his original trouble developed. One recent attack typical of chronic gastric ulcer was quite severe and persisted continuously for three months.

The principal findings on re-examination were an area of localized tenderness in the mid-epigastrium corresponding to the niche of a penetrating ulcer on the lesser curvature as seen with the fluoroscope. The stoma was functioning normally, at least two-thirds of the barium leaving by this route. A small six-hour barium retention was recorded. Gastric analysis showed no free hydrochloric acid, no gross food residue, bile ++, occult blood, and a total filtrate of 30 c.cm. Observation for ten days at the hospital confirmed the patient's statements with regard to the severity, the time of appearance, and the mode of control of the pain. On repeated aspiration during the height of his discomfort the gastric contents rarely exceeded 50 c.cm.; food residues were absent four hours after alimentation, and achlorhydria was constant. However, simple aspiration, emesis, eating, or alkalies gave consistent relief. On the basis of kymographic tracings made during a typical period of trouble it seemed reasonable to conclude that the pain was peristaltic in nature.

The second laparotomy revealed above the pylorus a large benign chronic ulcer 5 cm. in diameter. This was excised. The original ulcer was found to be healed, and the stoma was healthy and patent. The patient's convalescence was uneventful.

This case was of interest because of the apparent occurrence of a new gastric ulcer in the presence of a normally functioning gastro-enterostomy in addition to achlorhydria, and because of the typical syndrome of a benign ulcer in the persistent absence of free hydrochloric acid. The author cites previous cases of a similar nature and discusses in detail the causative factors giving rise to recurrence of ulcer after gastro-enterostomy and the various factors which may give rise to anacidity in the presence of a benign ulcer.

Payne, R. A., and Trahar, F. C.: Developmental Rests in the Cæcum and Ascending Colon and Their Roentgen-Ray Diagnosis. *Am. J. Roentgenol.*, 1921, n.s. viii, 643.

The authors make no claim for originality but desire to emphasize the importance of roentgen-ray methods in the diagnosis of conditions already well known to anatomists and surgeons. With regard to the changes of the cæcum and colon in foetal life they accept the theory of Harvey, which was based on that of Connell. Four main subdivisions are made, namely: migration, rotation, descent, and fixation. Abnormalities in any of these developmental changes are described under the headings "deficient" and "excessive." The various phases of changed positions and relations of the cæcum and adjacent structures in foetal life are reviewed.

Descriptions and illustrations of the normal descent and fusion in sthenic and asthenic individuals and of excessive descent of the cæcum are presented. The roentgen-ray evidence of deficiency in fusion must be in terms of the motility of the parts. Cases of abnormal motility of the cæcum and of fixed cæcum and mobile hepatic angle are illustrated. The resultant pathology is of the nature of a drag on the attachments causing impairment of function in bowel clearing. Frequently there is associated band formation from either foetal remnants or irritative substances passing through the bowel wall. Abnormalities of the appendix, such as retrocæcal location, are commonly associated with an anomalous position of the cæcum, but may occur even if the cæcum is normal.

In cases of non-descent, the cæcum is found lying well up under the right lobe of the liver, and if rotation has not occurred the ileum enters it from above and to the right. Two such cases are cited. In cases of deficient migration, non-fusion, and non-rotation, the cæcum is found hanging on the left side from the splenic angle, the loops of ileum lying to the right and the ileocæcal valve being on the right side. Four such cases are described.

Other cases of various types have been noted. The information to be derived from the roentgen examination may be of the utmost importance to the surgeon when corrective measures are indicated by symptoms due to abnormal functioning secondary to changed positions or other causes.

ADOLPH HARTUNG, M.D.

Tyler, A. F.: Recent Developments in Deep Therapy Technique — Facts and Fancies. *J. Radiol.*, 1921, ii, 24.

The types of cases suitable for radiotherapy are divided by the author into three main classes: (1) those in which radiotherapy is preferable, including epithelioma of the face and lip and certain types of mouth cancer, cancer of the cervix, and lymphosarcoma; (2) cases in which radiotherapy is optional, such as cancer of the tongue, cancer of the penis, and cancer of the breast; and (3) cases in which radiotherapy is the last resort, viz., all inoperable

cases of malignancy. There should be pre-operative treatment in all cases of malignancy and postoperative treatment in all cases.

As regards technique, stress is laid upon the use of high-voltage currents for the production of roentgen rays and on heavy filtration. For the past seven years not less than a 10-in. spark gap and a 6 mm. aluminum filter have been used. Relative to the advance in deep therapy, Tyler states that credit should be given the Germans for devising an ionization chamber to be used within cavities which permits actual measurement of dosages at a distance from the surface. The Germans have emphasized the importance of the fact that cancer cells are more susceptible to single massive doses than to repeated doses. Another advantage in the technique advocated by German clinicians is the use of a greater anode skin distance. With this, a greater volume of roentgen rays may be delivered to deep tissues with less skin reaction. The duration of the treatment must necessarily be lengthened to compensate for the added distance. When the anode skin distance is increased a larger port of entry may be employed and the secondary rays generating in the tissues themselves will be considerably greater than when the port of entry is smaller and the distance is closer.

The filter employed in the German technique is not less than $\frac{1}{2}$ mm. of pure copper. This has the same filtering quality as 12 mm. of aluminum and very materially cuts down the number of rays reaching the part treated unless the voltage is increased accordingly. Theoretically, the Germans aimed to do this; actually, however, some of the apparatus they are using does not furnish the required higher voltage.

The difference in the quantity of rays passing to the tumor through 6 mm. of aluminum filter and the quantity passing through $\frac{1}{2}$ mm. copper filter accounts for a considerable amount of the difference in the time factor employed by the Germans as compared with that employed in America. Another factor entering into this element is that in America it is the common custom to employ 5 ma. of current in the tube while the Germans usually employ only 1 or 2 ma.

The points in the report of the German technique which have been misleading are those dealing with the enormous voltage and the amount of dosage employed. In America, the root mean square voltage is used in estimating the voltage passing between two points. In Germany, the peak voltage method of measurement is used. Consequently the German clinical technique employs no higher voltage than that which some American radiologists have been using for a number of years.

In conclusion the author states that if increased filtration is used, higher voltages will be necessary to produce shorter wave lengths with greater penetration. The massive or lethal dose should be spread over a period of two or three days and the patient given proper preliminary and after-care.

The treatment is essentially a hospital procedure. Its chief value would appear to be for malignancy involving the pelvic viscera and in deeper structures of the trunk of the body.

ADOLPH HARTUNG, M.D.

Allison, R. G., Beard, A. H., and McKinley, G. A.: X-Ray Treatment of Toxic Goiter. *Am. J. Roentgenol.*, 1921, n.s. viii, 635.

The material on which this study is based includes hospital, dispensary, and private-practice cases of hyperthyroidism. No attempt at selection was made but they are divided into three groups. The first group included cases of toxic goiter with and without exophthalmos varying from mild to severe. The second group consisted of six postoperative cases of exophthalmic goiter. In the third group were three cases of thyrotoxic adenoma given roentgen-ray treatment; these are reported for whatever value they may have. The patients led their usual lives and no other coincident treatment was carried on. The estimation of the activity of the thyroid gland was based on the metabolic rate and the clinical signs and symptoms such as the pulse rate, the character of the gland, the eye signs, tremor, and nervousness. The metabolic rate was determined at intervals during the treatment, and in all cases the last rate was recorded and checked from three to six weeks after the last treatment.

All of the cases were treated with a standard dosage at three-week intervals. The radiation consisted of 30 milliamperes-minutes of ray filtered through 4 mm. of aluminum and one thickness of sole leather. The target-skin distance was 8 in., and the voltage was equal to an 8-in. spark gap measured between blunt points. Three portals of entry were used, one over each lobe of the thyroid and one over the thymus. If marked improvement was not noted at the completion of the fourth treatment the dosage was increased to 34 milliamperes minutes, the other factors being kept constant.

A tabulated abstract of the cases gives the symptoms before treatment, the duration and number of the treatments, the general effect of the treatments and their effect upon the basal metabolism, the pulse, the tremor, the eye signs, and the thyroid gland. The authors' findings are summarized as follows:

1. Of twenty-seven patients with uncomplicated Graves' disease who were subjected to roentgen-ray treatment but were not operated upon, twenty-four are well from both the clinical and the laboratory standpoint. The treatment has been complete for nearly eight months. The remaining three patients came to operation. Of these three, one was definitely benefited before operation and the two others were normal a few months after operation. Of six patients with postoperative hyperthyroidism which had relapsed, one showed a definite cure. The other five were not benefited. Of three patients with thyrotoxic adenoma none showed any response to roentgen-ray therapy.

2. The only patient of the series who was operated upon during an increasing basal metabolic rate died an operative death.

3. The results obtained in the earlier cases might have been obtained more quickly if more intensive treatment had been given.

4. No poor results or complications which could be attributed to the treatment occurred in any of the series.

5. Experience with the treatment described demonstrates that satisfactory results can be obtained only with the closest possible co-operation between the clinician and roentgen therapist.

ADOLPH HARTUNG, M.D.

Thompson, H. B.: The Treatment of Leukæmia. *Am. J. Roentgenol.*, 1921, n.s. viii, 629.

For practical purposes the author prefers the original textbook classification of leukæmias into the myelogenous and lymphatic types to some of the present-day classifications which include, in addition, Hodgkin's disease, aleukæmias, subleukæmias, myeloses and lymphoses, chloromata, lymphomata, granulomata, sarcomata, and primary anæmias. He recognizes the existence of mixed types but would assign the cases to the groups to which their predominating characteristics belong.

Among the therapeutic measures used in the treatment, benzol is mentioned but its use is not advocated. Splenectomy is still in the experimental stage. Radiotherapy offers the most promising results even though the improvement is only temporary. Roentgen-ray treatment is preferable to radium treatment. It makes very little difference where the radiation is applied, but the effect is apparently proportional to the amount of blood radiated. Nearly always in the true leukæmias the white cells show a greater decrease and there is an increased toxæmia when treatment is given over blood-filled organs such as the spleen and liver than when it is given over the long bones.

The case must be watched carefully during the treatment for signs of increased toxæmia, and the amount of treatment gauged accordingly. One can usually count on an improvement of the blood picture for a considerable time after the treatment has been stopped, and for this reason it is not advisable to bring the blood count below 15,000 to 25,000, depending on the rapidity with which it is falling when the treatment is stopped. After the blood has reached a practically normal white count there is still a great deal that can be done to benefit the patient. The erythrocyte count and the hæmoglobin content of the blood are usually low. These must be built up by rest, good food, tonics, and the administration of iron by mouth, hypodermically, or by transfusion.

The author uses a full 8-in. spark gap between ball points with a 4-mm. aluminum filter and sole leather, and usually gives a 5 to 10 X dose daily, applying it to a different area each day and treating up one side of the body and down the other.

If there is too much toxæmia the treatment is given every other day. The initial course is continued until the white count is nearly normal. Regular blood counts are made thereafter and another series of treatments is given as indicated by the blood picture and the patient's general condition.

Two cases of myelogenous leukæmia which came under the author's care within the last year are reported in detail. ADOLPH HARTUNG, M.D.

Failla, G.: Dosage in Radium Therapy. *Am. J. Roentgenol.*, 1921, viii, 674.

Dosage is better estimated by the amount of radiation absorbed by the tissues than by the amount emitted by the radio-active source. The measurement of such absorptions in calories is suggested. The law of conservation of energy obtains in the human body as elsewhere.

One gram of radium emits 134 calories per hour. Alpha rays give off 92 per cent; beta rays, 3.2 per cent; and gamma rays, 4.8 per cent. Since alpha rays never leave the container, only 8 per cent at best are available for treatment. When penetrating gamma rays are used, only 3 per cent of the total energy is available.

Whatever action there is in the tissues is due to the energy absorbed by the tissues. While our knowledge regarding the action of radium on cells is slight, it is known that this action is atomic. Atoms of the absorbing material are ionized. Ionization requires energy; as the radiation supplies this energy it loses by the action. Ionization makes possible chemical reactions which would not occur spontaneously. The author presents evidence of these reactions. On this basis a working hypothesis of the effect of radiation on living tissue is divided into three stages: (1) ionization at the time of radiation, (2) unusual chemical reactions due to the presence of ions, (3) disturbance of the equilibrium of the cells and the production of changes.

The author believes the therapeutic effect is due to a large extent to ionization. The amount of absorbed radiation is therefore a good basis for the specification of dosage as ionization depends on this absorption. The intensity of radiation, that is, the total amount of energy absorbed by a given tissue volume per hour, must be reckoned with, as time and space have a considerable effect on the reaction of the irradiated tissues. A statement of the milligram-hour dosage is indicative of the amount of energy emitted but not of the amount actually reaching the diseased tissue, which fractional amount varies greatly with the method and conditions of the application. The author discusses briefly the reasons why an accurate method of estimating dosage is necessary for efficient clinical results. Whatever method is adopted it must be of practical clinical value and be based on the following data:

1. Clinical history: the history of the lesion, the diagnosis, the location and size of the lesion, the extent of infiltration, etc.

2. Physical conditions of treatment: (1) the strength of the radio-active source, (2) its distribution, (3) total filtration used, (4) duration of irradiation, (5) relative positions of the radio-active source, pathologic tissue, and normal tissue.

The method of calculating the amount of energy absorbed is carefully worked out. It shows that an applicator composed of a tube containing 100 mc. of emanation, 14 mm. long, 0.5 mm. in diameter, with filtration of 2 mm. brass and 3 mm. rubber and a time exposure of 8.6 hours at a distance of 2 cm. from the skin will cause the absorption of 415 microcalories of energy by an area of the skin directly below the applicator measuring 1 cm. by 1 cm. by 1 mm.

Skin doses for several standard applicators have been worked out and the results are given in tables. Their erythema effects are shown to be fairly proportional to the author's calculation of calorie absorption. The equivalent of 2 mm. brass filtration results in the absorption of the radiation by the skin exponentially. A decrease in radiation with distance has also been determined. With various applicators of the same filtration the results as regards erythema in a large number of cases have adhered closely to the calculations, but the author does not have the necessary data to calculate the absorbed radiation with different filtrations. Much experimental work must be done to arrive at these calculations. Consequently Failla cannot state with certainty that the physiological effect depends on the amount of radiation absorbed by the tissue regardless of the quality of the radiation reaching the tissues. However, there is evidence to support this view. When this problem is solved a rational system of dosage of general applicability will be found. The author discusses various previously offered methods of dosage. Ultimately dosage depends on physical measurements.

The biological effect, e.g., skin erythema, cannot be used as a quantitative measure of irradiation. Comparison, however, is possible as it is known that a reduction of 20 to 25 per cent from the dose causing distinct reddening will produce no visible reaction. The average skin dose can be determined by observing a large number of cases.

Failla shows by a table that the ordinary method of expressing dosage by milligram hours which is in general use in this country permits a twenty-two fold variation in the milligram hours with a fairly equal skin dosage as reckoned by calories absorbed by the skin. With buried needles or emanation the variation would be many times greater. The influence of intensity as expressed by the number of microcalories per hour absorbed cannot be stated but certainly must be taken into account.

The decay constant of emanation per hour and tables for estimating the millicurie-hour dosage of any applicator are given. Another table shows the relative dosage of radiation reaching various depths for various special applicators.

A. J. LARKIN, M. D.

Bowing, H. H.: Hodgkin's Disease Treated by Radium and the X-Ray: Report of Four Cases.
Surg. Clin. N. Am., 1921, i, 1327.

Case 87394. Mrs. W. A. B., aged 40 years, came to the Mayo Clinic September 9, 1919, with enlarged axillary and supraclavicular glands following influenza. She had fever, night sweats, dyspnoea, increasing mediastinal dullness, and dullness at the base of the left lung. Examination of the blood showed a slight secondary anaemia and leucocytosis with 90 per cent polymorphonuclears. Roentgenograms revealed a mediastinal tumor and fluid at the left base. Section of a gland showed Hodgkin's disease. Sixty-three hundred milligram-hours of radium and deep roentgen-ray therapy were given over the involved areas.

November 5, 1919, there had been marked improvement. Twenty-six hundred miligram-hours of radium and deep roentgen-ray therapy were given as before.

March 5, 1920, the patient's condition was fair; 1,000 mg.-hrs. of radium treatment were delivered to the right cervical area. Deep roentgen-ray therapy was applied to the anterior and posterior chest walls and the right and left groins.

June 18, the condition of the patient was fair; 2,500 mg.-hrs. of radium treatment were delivered and deep roentgen-ray therapy was applied as before. January 12, 1921, there was a slight increase in the glandular enlargement; 1,600 mg.-hrs. of radium and deep roentgen-ray therapy were again given.

March 21, 3,700 mg.-hrs. of radium and deep roentgen-ray therapy were given.

April 12, the glands were decreased in size and the patient's condition was much improved. Deep roentgen-ray therapy was applied to the anterior and posterior chest wall, to the abdomen, and to the back.

Case 317995. Mrs. G. G., aged 28 years, came to the Clinic June 1, 1920, for multiple tumors of the head and neck which recurred after excision. Forty roentgen-ray treatments and twenty short radium treatments were given from September to December and were followed by much relief. The patient's face and feet had been swollen for a year. She had a cough and pain in the chest, and some of the glands broke down. The urine showed albumin, but examination of the blood and roentgenograms of the chest were essentially negative.

July 5, 1920, both cervical regions were given 9,700 mg.-hrs. of radium treatment.

September 1, the left cervical area was given 3,700 mg.-hrs. of radium treatment.

November 8, the patient returned in good condition but with the cervical glands possibly slightly larger. There was an apparently normal six months pregnancy.

Case 327080. Miss I. H., aged 22 years, came to the Clinic in July, 1920, complaining of attacks of knife-like pain in the back at times radiating to the chest and abdomen, enlargement of the cervical glands, and a productive cough, but no fever or

night sweats. She had a secondary anaemia and a slight leucocytosis, but other tests were essentially negative. Roentgenograms of the chest showed irregular consolidation and glands in the right middle lobe.

August 4, 3,650 mg.-hrs. of radium treatment were given in the supraclavicular and axillary regions.

September 27, 5,600 mg.-hrs. of radium treatment were given.

March 10, after an increase in symptoms, 1,400 mg.-hrs. of radium and deep roentgen-ray therapy were applied.

April 13, the patient felt improved. The glands were smaller and the physical examination of the chest was negative. She was given roentgen-ray treatment but no radium.

Case 319178. Miss J. P., aged 27 years, came to the Clinic June 9, 1920, complaining of enlarged glands, cough, fever, loss of weight, and general pruritis. In June the left posterior triangle was dissected out and a pathologic diagnosis of Hodgkin's disease was made. Deep roentgen-ray therapy was given.

In July the patient was again given roentgen-ray and radium treatment, and in October tonsillectomy was done.

In May, 1921, the patient was very dyspnoeic, with a large mediastinal mass and fluid at both bases. Deep roentgen-ray therapy was given to the involved areas.

C. E. JAMESON, M.D.

Blaisdell, J. H.: Squamous-Cell Carcinoma of the Antrum; Report of a Case Treated with Radium Alone That Is Free From Recurrence Twenty-Two Months After the Application.
Boston M. & S. J., 1921, clxxxv, 570.

The use of radium has materially improved the prognosis in cases of squamous-cell carcinoma of the antrum. Prior to its employment the very great majority of cases ended fatally in a comparatively short time. The author reviews the results of surgery as reported by Davis of the Charing Cross Hospital of London. Of nineteen cases, only three remained free from recurrence for a period of twelve months to two years. The results of a combination treatment with the actual cautery and radium reported by New of the Mayo Clinic are somewhat more favorable.

Blaisdell gives in detail the history of a case of his own treated with radium alone which is still free from recurrence twenty-two months after the last application. Fifty milligrams of radium element screened with 0.5 mm. of silver and 1.0 mm. of brass were inserted directly into the antrum through an opening in the canine fossa and left in place for twenty-four hours. This was repeated after about a month. After the second treatment there was marked necrosis resulting in sloughing away of the hard palate up to the median line and the alveolar processes. The patient suffered a great deal for about three months but at the end of that

time a large mass of sequestrum came away and he began to improve. The final result was complete removal of the antrum and its surrounding structures from the mouth to the orbit. The normal tissue healed readily and no further treatment or procedure was necessary. Within a comparatively few weeks the patient was back at his work and felt as vigorous as ever. ADOLPH HARTUNG, M.D

LEGAL MEDICINE

Construction of Contract Between Physicians.

State ex rel. Youngman vs. Calhoun, Circuit Judge (Mo.), 231 S. W. R., p. 647.

Certain property which was used both for his residence and for his office by the relator, a physician, was sold and conveyed by him and his wife to another physician with the agreement included in and as a part of the contract of sale that the owner would not establish himself as a practicing physician and surgeon within a radius of five miles of the premises after December 1, 1919, for a period of five years. Subsequently the relator opened an office and began making calls within the prohibited district, whereupon the other physician brought suit to enjoin him from maintaining the office and from practicing medicine and surgery in any manner with any former patients or any other persons living within the prohibited district.

After that, suit was filed, but prior to the hearing therein, the relator, admitting that his new location was within the prohibited district, closed his office there and made a tender of all fees he earned at the office, as well as the costs of the suit. On final hearing he was enjoined from making calls within the district or treating patients or residents of the district who might call at his new office which had been established outside the district. Thereupon the relator filed this application for a writ of prohibition against the judge, and one was issued, which was finally made permanent, prohibiting the judge from in any way undertaking to enforce against the petitioner the judgment or decree rendered by the respondent except so far as it enjoined the relator from opening or establishing an office for the practice of medicine or surgery within a radius of five miles of the property sold, for a period of five years from December 1, 1919.

After mature reflection the court stated that no other view could be taken than that the parties to the contract intended thereby that the relator should not maintain an office for the practice of medicine or surgery within the prescribed district, and nothing more. The court could not read the language of this agreement as intending to mean that he was not at any time within five years to call on or prescribe for any person living within a radius of five miles of his former home. Wherefore the court concluded it clear that the decree entered by the respondent, so far as it restrained and enjoined the relator in his practice of medicine and surgery from making calls within said prescribed district

or treating patients living within said district or treating former patients or residents of such district who might call at his office after it was established outside the said district, went beyond the terms of the contract and was to that extent in excess of the jurisdiction of the respondent.

J. A. CASTAGNINO.

Cannot Require Submission to Major Operation or One For Hernia. *Henley vs. Oklahoma Union Ry. Co. et al. (Okla.), 197 Pac. R., p. 488.*

The Supreme Court of Oklahoma stated that it is apparent that the state industrial commission misconstrued the provisions of the workmen's compensation law of Oklahoma in that it had exercised jurisdiction to order the claimant in this case, who developed a hernia as a result of an accident occurring in the course of his employment, to submit to a major operation under penalty of forfeiting his right to compensation in case of his failure to comply. The law provides for the injured employee proper medical and surgical treatment at the expense of the employer, and the treatment provided for is in addition to the compensation provided for during disability. Nowhere, however, is the commission authorized to require the injured employee to submit to a serious operation involving risk of life, however slight, in order that the pecuniary obligation created by the law in his favor may be minimized.

The award presupposed that the operation would be successful and that the claimant would be cured. That was in excess of the commission's authority. The respondents contended that an operation for hernia is not regarded as a dangerous or serious operation, but is a comparatively slight inconvenience and results in a permanent cure. The record did not disclose the kind of hernia the claimant had, but the court did not agree with the contention that an ordinary operation for hernia is to be regarded as a slight inconvenience and as a minor operation. Ordinary hernia requires the administration of an anæsthetic and an incision of the abdominal wall, and in some instances proves fatal. The rule appears to be supported by the overwhelming weight of authority that no man shall be compelled to take a risk of death, however slight, in order that the pecuniary obligation created by law in his favor against his employer may be minimized.

J. A. CASTAGNINO.

Tuckerman, J. E.: Medical and Medical-Defense Aspects of Fractures. *Ohio State M. J., 1921, xvii, 735.*

Fractures occasion one-half the suits against physicians. Therefore detailed records are exceedingly important and should give: the patient's previous health and economic status; the manner in which the accident happened; the patient's statement; the nature and extent of the injury; the operative procedures undertaken, including the names of those present; the progress of the case

in detail; and, in ambulatory cases, the exact dates of appointments and whether or not they were kept.

The mental attitude of the patient often reveals whether or not a suit is impending. Unfortunately it is true that charity patients or those misrepresenting their economic status are often induced to enter suit in the hope of gain.

Fractures usually occur as an incident in some active pursuit, and the individuals are in normal health. Hence no special attention is given to their general condition other than the following out of recognized hygienic rules.

Because of their importance as regards the prognosis and treatment of the fracture, the physician must keep in mind rickets, osteomalacia, osteomyelitis, tertiary lues, tuberculosis, and metastatic and primary malignant growths.

Pressure sores occur in the aged, the diabetic, and those with trophic disturbances. The necessity of applying splints in such a manner as to prevent necrosis is well recognized.

Delay in union resulting from lues demands specific treatment. If union has failed because of too great fixation, mechanical stimulation should be considered. An operation for slow repair, fibrous union, or even non-union is inadvisable.

Prolonged inactivity is serious for the aged because of the frequency of hypostatic pneumonia. Even in young persons pneumonia may become a complication. The alcohol addict is prone to pneumonia. Impairment of motion is not always due to changes in the joints, but may occur because of injury to either nerves or muscles or their involvement by callus. The possibility of tetanus must ever be borne in mind. Pain does not continue if the fragments remain in proper apposition. Complaint is often made of pain in the muscles similar to that called lumbago. Usually there is a history of a recent cold or sore throat. The question of focal infection and syphilis must be considered. Not all injuries resulting in fractures are immediately accompanied by loss of function.

The public has been taught to believe in the absolute finality of radiography. The value of the radiograph as an aid in the diagnosis cannot be ignored. As a matter of record, even when there is no uncertainty as to the nature of the fracture, a radiograph should be taken before and after reduction. The patient who states he cannot afford a radiograph is the very one for whom a radiograph should be made.

Restoration of function is a special problem. Much can be done to control excessive callus formation in the neighborhood of joints. In the restoration of function there is a very definite field for the use of active and passive motion, massage, and heat.

JOHN MITCHELL, M.D.

Eastman, L. E.: Legal Phases in Relation to Liability for Malpractice, with Special Reference to Fractures. *Ohio State M. J.*, 1921, xvii, 739.

Malpractice is defined in *Craig vs. Chambers*, 17 Ohio State Report 253, as follows:

"The implied liability of a surgeon retained to treat a case professionally extends no further in the absence of a special agreement than that he will indemnify his patient against injurious consequences resulting from his want of a proper degree of skill, care, or diligence in the execution of his employment

By accepting the retainer the surgeon bound himself to bring to the performance of his undertaking a reasonable degree of care and skill, but in the absence of a special agreement to do so he did not undertake to perform a cure; nor can negligence be implied from the failure of the defendant to effect a cure. Such failure may have arisen from the age and constitution of the patient, or from the inherent difficulties growing out of the nature of the injury which may have been such as to baffle the highest degree of skill and care."

In the much quoted case of *Gillette vs. Tucker*, 67 Ohio State Report 106, the statement of the Court was as follows:

"The engagement was such that the law implies a promise on the part of the surgeon that for the operation and subsequent necessary treatment he would use due care and diligence to the end that a recovery might be had. This obligation arose in the contract of employment and as a matter of law, and the obligation existed as long as the relation of patient and physician and surgeon continued. In the engagement the surgeon assumed to exercise the ordinary care and skill of his profession in the light of the modern advancements and learnings on the subject, and became liable for the injuries resulting from his failure to do so.

"This degree of skill and care is to be exercised not only in performing the operation but also in the subsequent necessary treatment following such operation, unless the terms of employment otherwise limit the service or the patient gives the surgeon notice that he will not or cannot afford the subsequent treatment."

As to diagnosis, it has been held that the doctor is liable if he fails to ascertain the nature of the injury or ailment from which the patient suffers. If he makes a mistake in his diagnosis and this mistake is occasioned by his failure to use proper methods and proper care, he is liable for injuries which may result. The test is applied under the conditions that exist at the time the doctor is called, the opportunity he has to make the diagnosis, the condition of the patient, and all the surrounding circumstances.

A mistake in diagnosis is not ground for malpractice unless it is followed by wrong treatment. The physician is required to follow the approved method of treatment, and that approved method must be the up-to-date method. If he experiments, he does so at his own risk.

The ordinary practitioner is not held to the same degree of skill as a specialist but is required to exercise the degree of skill and care exercised by the members of his profession in the same or a similar locality in the light of the present state of medical science.

ILLUSTRATIVE CASES

A boy had his foot run over by a truck. The doctor found a laceration on the under-side which he cleansed, treated, and bound up. The foot did not improve. The father then employed another physician. The second physician examined the foot with the X-ray and discovered a fracture of one of the bones. In discussing this case Eastman states that when there is an opportunity to make an X-ray examination in the treatment of an injury suggesting a fracture, the failure to do so is malpractice of itself.

A young bank clerk who was suffering with pain in his arms, wrists, and hips was given treatment for articular rheumatism. This was followed by immediate improvement. After a week or ten days the patient insisted upon going to a dance against the physician's orders. Subsequently his condition became worse. The physician was then called to task by the boy's parents because they charged he had not treated the case properly and had not given the boy proper instructions. He then left the case, and a short time afterward learned that a chiropractor had been engaged. The malpractice suit followed. The claim in the suit was that the physician had failed to diagnose a fracture of the neck of the femur. He had been very careful, however, to inquire of the young man whether he had had any injury to his hip, which seemed to be the seat of the trouble, and was told that he had not. A fracture was revealed by the X-ray. During the pendency of the case the patient died of pulmonary tuberculosis and tuberculous peritonitis. Eastman's comment with regard to this case is that if the physician had had a roentgenogram made as soon as he was called on the case, such a claim would have been impossible and he could have saved himself the unpleasant experience of being sued.

APPROVED METHODS OF TREATMENT

When there are two or more approved methods of treatment the doctor is required only to exercise his best judgment in selecting which of them it is best to follow. A case in Cincinnati, *Moehleman vs. Ransohoff*, is in point. The injury involved was a compound fracture of the humerus. It appeared from the evidence that this was a very obstinate case and that the doctor had used the proper care and skill in making his diagnosis and in attempting to reduce the fracture. He had attempted to hold the parts in place by the use of plates. The testimony of the experts showed there was a difference in opinion as to the course to pursue, one course being as much approved as the other. The court directed a verdict for the defendant on the ground that the doctor was not liable when he selected one of two or more approved courses of treatment.

CONSIDERATION OF NEGLIGENCE

It has been held that a doctor is not required to accept a case unless he so desires, even though he may be the only physician available. He has the right to refuse, but if he assumes the case and the

patient is relying upon him, he cannot abandon it without good reason and proper notice to the patient. A physician responding to the call of a patient thereby, in the absence of a special agreement, becomes engaged to conduct the case as long as it requires attention unless he gives notice to the contrary or is discharged by the patient. But when a patient goes to the office of the physician, from whom he receives proper treatment, and then fails to return for further treatment, he has no right of action against the physician because of subsequent suffering.

A physician is not chargeable with neglect on account of the intervals elapsing between his visits when the injury requires no attention during those intervals, but he is negligent when attention is required. He is permitted to leave his practice temporarily if he makes provision with a competent physician for attendance upon his patients, but a physician who leaves his patient at the critical stage of a disease without reason or sufficient notice to enable the patient to procure another medical attendant is guilty of dereliction of duty and is liable.

A physician has been held liable also to respond in damages for failing to attend a patient when he was at the time engaged in a confinement case which he had previously assumed. The doctrine on which the decision was based was that the doctor himself contracted the obligation, and that if he contracted a greater number of obligations than he could meet it was his own loss.

Performing an operation without the consent of a patient, except in very exceptional cases when the patient is unconscious or in a similar emergency, is ground for malpractice. A case went to the Supreme Court, *Wells vs. Van Nort*, in which the surgeon operated upon a woman for appendicitis. She and her husband had both consented to the operation. The surgeon informed the husband after the operation that he had found the fallopian tubes infected and had removed them. He said, "I could have treated them in four or five months, but she is better off without them." The Supreme Court held that this condition was not an emergency justifying the removal of the tubes and that the surgeon was liable.

INSTRUCTIONS TO PATIENTS

In taking charge of a case it is the duty of a physician or surgeon to give his patient all necessary and proper instructions as to what care and attention he should have in his absence. For failure to discharge his duty in this respect he may be liable in damages. If some method can be devised whereby we could have positive and definite evidence as to what instructions were given, it would be of great value. It is suggested that the instructions necessary be written out on a printed form and that a carbon copy be retained by the doctor. Very often the issue as to just what instructions were or were not given is sharply defined and is resolved into a question of veracity between the doctor and the patient who is often corroborated by others.

LIABILITY FOR ASSISTANTS

Our Supreme Court has held emphatically that the surgeon cannot escape liability by claiming that it was the duty of the nurse to count the sponges, the use of sponges being just as much a part of the operation as the use of a knife or other instrument. A doctor is not liable, however, for the acts of an intern in the treatment or dressing of a case in his absence or when the intern is not under his direct supervision, but he is liable for the acts of his assistant. If he employs another surgeon to perform an operation, both he and the operator are jointly liable for negligence as long as they are jointly engaged. He therefore must use due care in selecting his assistant or the surgeon he employs to perform an operation.

THE STATUTE OF LIMITATIONS

In Ohio the present situation with regard to the statute of limitations is discouraging. In the case of *Gillette vs. Tucker*, 67 Ohio State Report 106, in which the claim was made that a sponge was left in the abdomen the patient returned to the doctor almost daily for treatment. There was a running sore discharging pus which required dressing twice a day. In her petition the plaintiff charged that it was a continuing duty on the part of the doctor to remove the sponge every day she went to him, and that each day it annoyed her constituted a new breach of his duty toward her. The Supreme Court sustained this contention and held that the after-treatment was as much a part of the operation as anything else.

The statute of limitations provides that an action for malpractice is barred within one year after the cause of action accrues. The difficulty has arisen in determining when the cause of action accrues. In the *Gillette* case it was held that the cause of action accrued at the time the relation of patient and physician terminated. In the case of *Bowers vs. Santee*, 97 Ohio State, and *Gillette vs. Tucker* the Supreme Court held that the cause of action accrued and the one-year limitation began at the time the relation of physician and patient terminated.

The statute of limitations is a statute of repose. It is the policy of the law that litigation should be put at rest during the time that witnesses are available and evidence has not been lost or destroyed.

J. A. CASTAGNINO.

Hints Regarding Expert Testimony—Duty of Surgeon. *Lehman vs. Knott (Ore.)*, 196 Pac. R., p. 476.

The Supreme Court of Oregon stated that an expert's opinion on a hypothetical statement of fact should be exact as he is not allowed to draw inferences or conclusions of fact from the evidence. It is

the privilege of counsel to assume any state of facts which there is any testimony tending to prove, and to have the opinion of the expert based on the facts assumed. If the hypothetical question is clearly exaggerated and unwarranted by any testimony in the case, an objection to it should be sustained.

The form of the hypothetical question, whether it states facts, puts facts hypothetically, or refers to the testimony of witnesses as being true, should be shaped so as to give the witness no occasion or opportunity to decide on the evidence. Hypothetical questions are clearly improper if they directly seek the opinion of the witness on the merits of the case. In a malpractice case the question as to whether in a given case a physician has adopted the proper treatment is one on which medical men may give their opinion in evidence and may state whether in their opinion the treatment was proper or not and whether it was in conformity with the rules and practice of the profession.

As the opinion-evidence rule is intended to provide against the danger of invasion of the province of the jury, a court should, as far as possible, exclude the inference, conclusion, or judgment of a witness as to the ultimate fact in issue, even though the circumstances presented are such as might warrant a relaxation of the rule excluding opinions but for this circumstance. However, the rule is not absolute, for frequently the only possible or practicable method of making proof of the fact in issue is by means of opinion evidence.

In the case under consideration it was an error to ask a medical witness whether the application of side splints was unskillful and negligent. The distinction between improper treatment and negligent treatment is not as broad as it is vital. Improper surgical treatment might be due to an error in judgment of a skillful surgeon and might not constitute negligent treatment. It would seem that if the opinion of the experts is to be of any assistance to the jury it would be necessary for them to know the condition in which the splints were applied to the arm. If the splints practically encircled the wrist, the court failed to see that it would be very material whether they were termed "side splints" or "anterior and posterior splints." Moreover, while mention was made of the place where the defendant practiced and treated the plaintiff, the practice regarding which the experts were interrogated was in no way confined to the practice in similar localities. The fact that a witness who was skilled in medicine and surgery had never treated a similar case would not disqualify him from giving his opinion. The objection would go only to the weight of his testimony.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Okabayashi, H.: Radical Abdominal Hysterectomy for Cancer of the Cervix Uteri; Modification of the Takayama Operation. *Surg., Gynec. & Obst.*, 1921, xxiii, 335.

The author chooses the abdominal route instead of the vaginal because by the former he can dissect out the parametrial and paravaginal tissues more completely. The patient is given no special preparation. The abdominal incision is made long to allow free exposure. An examination is made to determine the operability and extent of the growth.

The first step is the division of the broad ligament down to the entrance of the uterine arteries to the cervix, the ovaries being removed or left, according to the indications. Next, the uterine arteries, which are found at the base of the broad ligament, are ligated, and the ureters then separated from the posterior layer of the broad ligament. In the next step the rectum is separated from the vagina, and the loose pelvic tissue, the glands, and infiltrated areas are freed by blunt dissection. The exposed blood vessels are easily ligated without loss of blood.

The operative measures posterior to the uterus having been completed, the bladder is separated from the cervix, the ureters are isolated from the tissue at their entrance to the bladder, and the bladder separation is then completed. The anterior and lateral parametrial and paravaginal tissues are severed between clamps. R. E. CHRISTIE, M.D.

Kelly, H. A.: Uterine Polyps. *Therap. Gas.*, 1921, xlv, 761.

The author uses the term "polyp" in its general clinical and historical sense, applying it to all pedunculated mucous or fibrous tumors of the uterus or cervix which are covered with mucous membrane.

Mucous polyps arise either from the mucosa of the uterus or cervix, while fibrous or muscular polyps develop from the deeper layers of the uterus.

Mucous growths usually are small, being about the size of a pea or raspberry, while a fibrous tumor is usually the size of an egg though it may attain that of a fist.

Mucous polyps are usually single or at the most two, while fibrous polyps are obviously single, but within the body of the uterus are often found in groups.

A polypoid endometritis should not be mistaken for a polyp, for it has no relation to it. The former has an abundance of material coming from the endometrium, while the true polyp is single, elongated, and smooth.

Polyps may be grouped clinically as intra-uterine and extra-uterine. The latter are readily seen and

indicate the source of a hæmorrhage, while the former would not be readily diagnosed in case of hæmorrhage.

A brief review of the history of polyps is interesting and instructive. Levret (1703-1780) invented a forceps to throw a wax ligature around the pedicles of intra-uterine polyps. Attempts were made to cause the expulsion of the polyps by the use of drugs such as iron and ergot but were unsuccessful. In the latter part of the last century a powerful chain-saw instrument, the invention of Charles Chassaig-nac, was used very extensively. Excision with the scissors was also performed, the bleeding being controlled by tight uterine packing.

In Sim's time the external os was opened to render the uterine cavity more accessible, and a Chassaig-nac ecraseur was applied. With the advent of anæsthesia and greater skill in the manufacture of instruments much progress was made in the treatment of intra-uterine polyps. Two dangers, however, still frequently threatened, namely hæmorrhage and sepsis.

Occasionally the peritoneum was inverted into the pedicle of the tumor or an inverted uterus was mistaken for a fibroid polyp.

Today the first step is the correct diagnosis. Sessile cervical tumors may be safely twisted off or burned with the cautery. Small intra-uterine polyps can be twisted with polyp forceps, while larger ones, the size of an egg or larger, should be excised after the cervix has been opened in the midline to the uterine cavity.

If the tumor is very large it should be bisected after being grasped between two museau forceps and before being excised at the pedicle. In this way fatal results may be avoided should the peritoneum or fundus be inverted into the tumor mass.

C. H. DAVIS, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Smith, R. R., and Butler, W. J.: Concerning Torsion of the Uterine Adnexa Occurring Before Puberty, Together with a Consideration of Torsion of Normal Adnexa: Report of a Case and a Review of the Literature Since 1900. *Am. J. Obst. & Gynec.*, 1921, ii, 507.

Torsion of ovarian tumors is an uncommon occurrence in childhood, as shown by the fact that only 26 cases, including those reported by the authors, have been reported in the literature since 1900. About 50 per cent of these tumors occurred between the ages of 8 and 10. Sixty per cent of them were dermoids. They varied in size from that of an adult ovary to growths which reached above the umbilicus.

The symptoms are those of an abdominal crisis similar to that of the same accident in adult life—sudden abdominal pain, vomiting, a variable degree of prostration, tenderness, rigidity, distention, fever, an increase in the pulse rate, and the presence of an abdominal tumor. The diagnosis is usually difficult, probably because of the rarity of the condition. Appendicitis is often the pre-operative diagnosis. The causes are much the same as in adult life.

Fourteen cases of torsion of normal adnexa have been reported to date. Eight occurred before the age of 20; four under 12, presumably before puberty.

The tube alone may be involved, the tube and ovary together, or the ovary alone. In a large percentage of the cases the torsion occurs in close relation to the menstrual period. Three reported occurred during pregnancy. Some question still remains as to whether a normal tube can undergo torsion, but it seems to have been proved that a normal ovary may do so. Factors such as the length of the mesentery, the size of the ovary, and the length of the tube must be considered as well as the histologic structure of the organ.

Torsion of adnexa in hernial sacs (apart from strangulation) is relatively rare. It occurs only in congenital inguinal herniæ and usually in the first year of life.

E. L. CORNELL, M. D.

Delépine, J.: Strangulated Hernia of the Fallopian Tube (Le hernie de la trompe de Fallope; son étranglement). *Rev. franç. de gynéc. et d'obst.*, 1921, xvi, 548.

Though not so rare as some authors allege, hernia of the tube is less frequent than tubo-ovarian hernia. Delépine reports the case of a woman 53 years of age who came to the hospital with a small swelling in the left groin which was first observed at about the age of 50 but was easily kept reduced by means of a bandage until the crisis necessitating treatment. A diagnosis of strangulated epiplocele was made. At operation, a cylindrical cord the size of the little finger was found in the sac instead of omentum or intestine. This proved to be the fallopian tube. Its walls were much thickened and infiltrated, and showed ecchymoses. The patient recovered.

This type of hernia is usually discovered only at autopsy or operation. Since the time of Cruveilhier it has been generally believed that hernia of the tube precedes hernia of the ovary. Recent studies, however, have shown that this is not always true. As a rule the outer end of the tube leaves the abdomen and drags the rest of the organ after it, but in other cases it forms a loop with its convexity downward and forward, the internal and external extremities remaining within the abdomen. The latter was the mechanism in the author's case.

In the adult the herniated tube is usually diseased. In most cases there are no symptoms indicating its involvement in a hernia. Strangulation may occur but lacks the serious consequences of strangulation of an intestinal loop, and the patient may go on for a considerable time with this condition. The

symptoms of such strangulation closely resemble those of hernial strangulation of the vermiform appendix. If the strangulated organ is not freed by operation it becomes gangrenous and there is supuration of the sac. The prognosis of operation is always good. Therefore surgical treatment is indicated in every case.

W. A. BRENNAN.

Hellendall, H.: A Case of Pregnancy After Sterilization by Double Ligation and Division of Both Fallopian Tubes (Ein Fall von Schwangerschaft nach Sterilisierung mittels doppelter Unterbindung und Durchschneidung beider Eileiter). *Med. Klin.*, 1921, xvii, 1116.

In a woman 43 years of age both fallopian tubes were doubly ligated and divided to effect sterilization. Three years later, after a delay of the menstrual period for eight days, a sudden and severe hæmorrhage set in which persisted for four weeks. Curettage revealed tissue containing chorionic villi (Pathologic Institute of Duesseldorf).

There are three possible explanations: (1) the fallopian tubes may have grown together again and their lumina may have become patent as the result of gradual loosening of the ligature; (2) the peritoneum may have been so injured during the ligation that a peritoneal fistula resulted; and (3) there may have been atrophy of the musculature due to pressure of the ligatures which resulted in patency of the lumina (Nuernberger).

GEPPERT (Z)

Malcolm, J. D., and Gibb, G. A.: Over Five Hundred Gallons of Fluid from an Ovarian Tumor. *Brit. M. J.*, 1921, ii, 631.

The cyst in the case reported was first noted in 1893. A consulting surgeon then advised against operation. In the next ten years the patient had probably more than twenty-five tapplings, although no record was kept. It is estimated that about 506 gallons of fluid were removed. Twice an attempt was made to remove the cyst.

At autopsy it was found firmly adherent everywhere and the wall was so friable that removal would have entailed many hours of careful dissection. The patient had had an enormous appetite, which indicated the nourishment required by the growth, and she had been kept alive only by removal of the pressure.

Two other instances are described wherein large amounts of fluid were removed by tapping.

J. W. ROSS, M.D.

Holden, F. C.: Radical Conservatism in the Surgical Treatment of Chronic Adnexal Disease. *Am. J. Obst. & Gynec.*, 1921, ii, 493.

The author's technique is described as follows:

After severance of the adhesions, the inflammatory mass is brought into view and inspected to determine the extent to which the diseased tissue shall be retained. An incision of the diseased tube is made along its anterior surface, from the clubbed end to the uterine cornua. This is best done with a

sharp-pointed, straight scissors. After a culture specimen is taken, the tube is wrapped in a hot, wet pad, while the other side, if involved, is similarly treated. The bleeding of small severed vessels is controlled by fine suture ligaments. The incised tubes are suspended to the round ligaments by three or four fine interrupted linen sutures so as to turn the raw surface of the incised tubes downward. The ovaries are suspended (Pool method) by drawing the peritoneum away from the side of the pelvis and uniting it with a fine linen suture to the peritoneum of the infundibulopelvic ligament, just as it reaches the ovary. The uterus is then suspended. The procedure of choice in this class of cases has been the Olshausen operation. Thus it will be seen that the retroverted uterus with its adnexa is freed, the tube or tubes are incised, and all are so suspended that they cannot reach the cul-de-sac.

In the first case drainage was established through the vagina, but in the remainder, closure was effected without drainage. Cultures in all cases were negative. Each patient made an uneventful recovery with about the same postoperative morbidity as that associated with radical operations for similar pathologic lesions.

The conclusions drawn are as follows:

1. It has been demonstrated that pyosalpinges may be incised and suspended without mortality or excessive morbidity.

2. A young woman with chronic adnexal disease who is physically disabled and does not respond to several weeks' rest and treatment should be offered a choice between radical operation, with its surgical menopause, and conservation, with its possibility of re-operation.

3. If conservation of ovarian tissue is decided upon, the technique described in this article may be of benefit.

E. L. CORNELL, M.D.

EXTERNAL GENITALIA

Allan, J.: Imperforate Hymen. *Med. J. Australia*, 1921, ii, 402.

The author was called at night to see a young girl, 13 years old, who was complaining of severe headache, giddiness, great pain over the lower abdomen, and difficulty in urinating.

According to the history there had been a menstrual menses every month for the four previous months, with difficult urination and a feeling of inability to evacuate the bowel completely. The temperature was found to be 39.2°C, the pulse 120, and respiration 30 per minute. Oblique light showed the intestines to be making "ladders" all over the abdomen, and the peristaltic waves were very marked to the palpating hand. The abdomen was too tender to allow deep palpation, but a rounded swelling reaching halfway to the umbilicus could be seen and felt. Lying on this swelling was a smaller rounded swelling extending about 6.25 cm. above the pubes.

A sedative was given that night. The next morning a vaginal examination under anaesthesia disclosed an imperforate hymen which completely occluded the orifice. In the center was a small, thinned translucent area 6.25 mm. in diameter which, when punctured, allowed the escape of a thin, dark brown, odorless fluid. The pressure at first forced a column of the fluid up about 25 cm. About 740 c.cm. of this fluid were collected.

The fluidity of the discharge in this case was remarkable as it is generally described as tarry in consistency. The inspissated matter usually evacuated is generally attributed to absorption but in this instance little or no absorption could have taken place. The author is of the opinion that the explanation of the varying consistency of the matter evacuated and the various ages at which the symptoms begin is to be found in the permeability of the occluding membrane.

In the case reported evacuation of the bowel did not change the temperature, and as the symptoms cleared up after evacuation of the fluid it is difficult to believe that the toxins were the products of infection. This leaves the menstrual blood as their probable source and leads to two questions: Is the menstrual discharge of the nature of an excretion containing toxins? Or were the toxins produced by decomposition?

The thin central area found in the hymen would seem to favor the view that the latter is developed from the end of the solidly fused muellerian ducts, as apposed to the view that it is a later growth of the vaginal mucosa.

C. H. DAVIS, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Caulk, J. R.: Renal Tuberculosis. *J. Urol.*, 1921, vi, 97.

In the author's series of cases about 22 per cent of the operations on the kidney were for tuberculosis. Caulk emphasizes the importance of early diagnosis and early nephrectomy. The chief diagnostic aids are the cystoscope and the pyelogram. In Caulk's series of fifty-five cases there were no deaths although the average mortality of nephrectomy for renal tuberculosis is 7 to 10 per cent.

T. F. FINEGAN, M.D.

Quinby, W. C.: The Transperitoneal Approach to the Kidney, Its Indications and Limitations. *J. Urol.*, 1921, vi, 135.

The transperitoneal approach to the kidney has been practically abandoned by the majority of operators because of the shock which follows its use and the danger of peritonitis. The author, however, strongly recommends it for selected cases. In many cases of hypernephroma the renal vein is invaded. Ligation of the renal vessels by means of the transperitoneal approach will lessen trauma and the subsequent dissemination of the tumor cells throughout the body. This holds true also for a limited number of cases of tuberculosis. It is not uncommon to find generalized miliary tuberculosis following nephrectomy by the lumbar route. Attention was called to these types of cases in 1905 by Walker. In 1907, Holt reported the cure of a persistent renal fistula by ligation of the renal vessels after four attempts at nephrectomy. Kellock did the same in 1913 in a case of stone with a sinus after two attempts at nephrectomy.

Two interesting cases are reported by Quinby. The first showed a marked aneurism of the abdominal aorta. The renal vessels were not ligated. Autopsy demonstrated a fusiform aneurism of the aorta closely adherent to the lower pole which had been caused by a long-standing psoas abscess. The lower pole of the left kidney and the kidney pelvis were involved in the infection.

The second case demonstrated ligation in the treatment of a renal tumor. Exposure by the lumbar route showed the right kidney to be filled with the growth. Delivery of the kidney was impossible because of dense adhesions and its size. The neoplasm was diagnosed as a hypernephroma. Later ligation of the renal vessels was done. The patient died of pulmonary tuberculosis. Autopsy revealed pulmonary, hepatic, and splenic tuberculosis. The kidney showed soft necrotic material with only a very small area of tumor tissue.

C. D. PICKRELL, M.D.

Hammer, A. W.: The Difficulties in the Diagnosis of Ureteral Calculi. *Am. J. Surg.*, 1921, xxxv, 348.

As the pain in affections of the kidney and ureter is not always the typical pain described in the textbooks, its significance is often misinterpreted. In some cases it may be referred to the region of the appendix and gall-bladder, and gastro-intestinal symptoms, such as nausea, epigastric distress, and indigestion, may be present.

The roentgen rays and other adjuncts are invaluable aids in the diagnosis but in some instances may lead to error; calculi which may be present may not be demonstrated by the roentgen ray, and occasionally extra-ureteral shadows are mistaken for those of calculi.

Although much dependence is placed upon urinalysis, in a certain number of cases the urine may be normal and in others the presence of blood and pus may be due to causes other than stone such as renal tumor, renal tuberculosis, acute cystitis, and bladder tumor.

HERMAN L. KRETSCHMER, M.D.

Judd, E. S., and Struthers, J. E.: Primary Carcinoma of the Ureter: Review of the Literature and Report of a Case. *J. Urol.*, vi, 115.

The authors have collected twenty-five cases of primary tumors of the ureter from the literature and add one case of their own. Calculi were found in only four of the cases and thus could be considered as an etiological factor in only 16 per cent. Some writers consider leukoplakia as a probable origin of both benign and malignant neoplasms.

Tumors of the renal pelvis and ureters are classified as: (1) epithelial growths: (a) papilloma, (b) papillary epithelioma, and (c) epithelioma (non-papillary); (2) mesodermal growths; and (3) adenocarcinoma. In the cases collected by the authors carcinoma predominated, there being ten cases in the group of twenty-five. The other fifteen cases were about equally divided between papillary and non-papillary epitheliomata. Hydronephrosis was definitely known to be present in 40 per cent of the cases, and in others there were findings suggestive of hydronephrosis. If infection takes place, pyelonephritis or pyonephrosis with fever will develop. The kidney may become large and palpable.

Hæmaturia, the most frequent initial sign, is usually profuse, and when clots are formed the pain is apt to be colicky. When ureteral clots are expelled, they are seen in the form of casts. Vesical disturbance, manifested by frequent micturition, is common. Pain occurred in about one-third of the cases and varied from a dull ache to colic; sometimes both types were present. The age incidence was found to be between 40 and 60.

Cystoscopic examination revealed variable findings. The bladder may appear normal; the growth may be seen bulging from the meatus; an inflammatory reaction about the meatus, manifested by a ring of oedema, may be seen; or there may be diffuse cystitis as a sequel to infection above following partial obstruction. Again, the ureteral catheter may meet with obstruction at any point along the course of the ureter and, depending on the degree of the obstruction as well as the length of time it has been present, various pathologic states of the kidney may be found. Thus, there may be pyelonephritis, hydronephrosis, or pyonephrosis with any grade of destruction of renal tissue. Blood may be seen oozing or clots protruding from one ureteral meatus, or if neither, the passing of the ureteral catheter may start profuse bleeding.

The treatment is governed by the extent and location of the lesion as well as by the integrity of the kidney. When the growth is in the lower ureter, a ureteral catheter should be passed by the surgeon in an attempt to rule out other growths higher up. If no growths are present, an attempt to transplant the ureter into the bladder at a new point should be made. In cases in which there is an infected, functionless kidney, nephrectomy and ureterectomy should be performed.

The authors state that the immediate results of surgery are good, but there is grave danger of recurrence of the disease within a few months or several years after operation.

The case reported was that of a man, aged 48, whose urologic symptoms began with hæmaturia and pain in the head of the penis at the end of urination. Hæmaturia occurred every four to seven days and lasted two days, varying considerably in quantity from time to time. For six months there was daily hæmaturia. One attack of acute pain in the suprapubic area as well as in the glans penis occurred during the passage of a clot 1.25 by 1.87 cm.

The general examination was negative. The urine showed a few pus cells, and the roentgenograms showed a suspicious shadow in the lower left ureteral area. Cystoscopy revealed hæmaturia on the left side and obstruction of the left ureter at the meatus due to a neoplasm which bled easily on contact. There was apparently no urinary secretion from the left side. Functional and other findings were normal for the right side. A diagnosis of left ureteral and left renal neoplasm was made and exploration of the left kidney and left lower ureter was advised.

January 10, 1921, the left kidney, which was pyonephrotic, was removed. Convalescence was uneventful. January 21, 1921, the left ureter and an area of bladder 3.5 by 2.5 cm. were removed through an anterior extraperitoneal incision. A papillary epithelioma 8 cm. in diameter was found in the lower ureter. Above it the ureter was about 3 cm. in diameter. February 21 the patient was discharged in good condition with wounds healed.

J. W. PANGBURN, M.D.

BLADDER, URETHRA, AND PENIS

Hunt, V. C.: A Huge Diverticulum of the Bladder. *Surg. Clin. N. Am.*, 1921, 1, 1267.

The author reports a case of diverticulum of the bladder in which suprapubic drainage was effected. Three weeks later, when renal function had greatly improved, the suprapubic sinus was enlarged and a huge diverticulum with a capacity of 1,000 c.cm. was found arising from the right wall of the bladder and closely associated with the right ureter. The ureter was cut, doubly ligated at the base of the pelvic brim, and dropped back. The diverticulum was excised by the transperitoneal route and the peritoneum then accurately closed without drainage.

Severe reaction followed the operation. The urine was scanty, the abdomen distended, the pulse rapid, and the general condition poor after thirty-six hours. This was explained on the basis of peritonitis and renal insufficiency. Under local anaesthesia the abdomen was opened, drains were inserted for the low-grade peritonitis, and the distended pelvis of the right kidney was drained through the back. The catheter was left in the right kidney pelvis for three weeks. At the end of this time 15 per cent of phenolsulphonephthalein return was obtained through the catheter from the right kidney and 25 per cent through the bladder from the left kidney in two hours and fifteen minutes.

On removal of the catheter the sinus immediately closed and the kidney atrophied. Cystoscopic examination later showed urine entering the bladder only from the left kidney.

The large size of the diverticulum and the effect of ligation of the ureter are of interest. Drainage of the right kidney carried the patient along until the left kidney was able to compensate and take over the entire function. G. S. FOULDS, M.B.

Mayo, C. H.: The Formation of a Cloaca in the Treatment of Exstrophy of the Bladder. *Surg. Clin. N. Am.*, 1921, 1, 1257.

Exstrophy of the bladder is a very rare anomaly resulting from failure of the maternal placenta properly to remove embryonic residues from the foetal circulation during the renal functional change from wolffian body to kidney. If the embryonic bladder is not developed sufficiently to care for this premature function, it probably splits its anterior surface, including the urethra and the hypogastric canal, to the umbilicus.

This condition has been seen in seventy-two patients at the Mayo Clinic, most of whom were less than 30 years of age. Thirty-six of these were operated on, twenty-nine successfully. The operative mortality was less than 20 per cent.

In the early cases the method of Maydl and Moynihan was employed; an artificial cloaca was formed by making an opening between the bladder and the anterior rectal wall. Patients operated on later have been treated by the Coffey method of transplanting

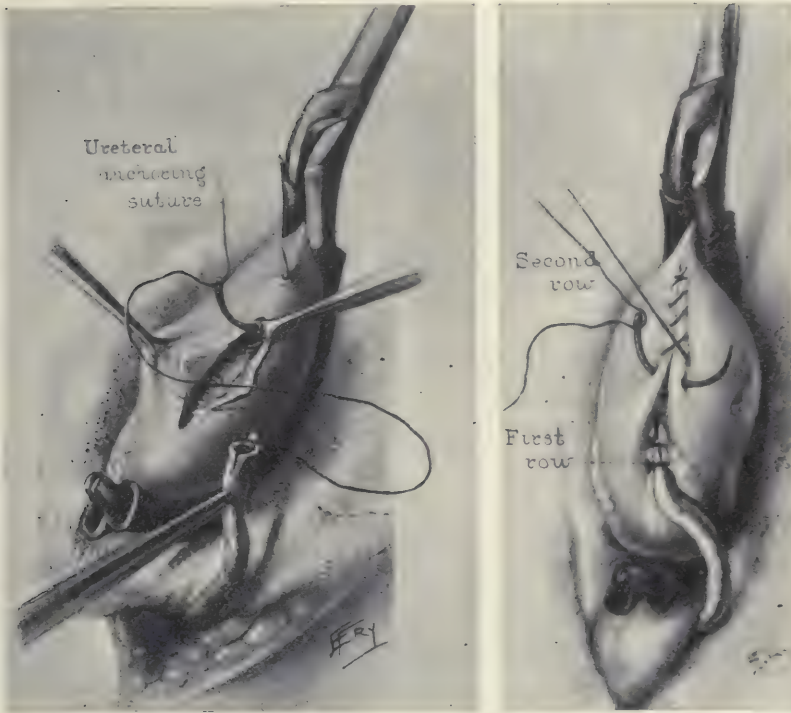


Fig. 1 Mucous membrane exposed and opening made in the mucosa to receive the ureter.

Fig. 2 Entire area buried beneath the continuous approximating sutures in the serous coat.

the ureters into the sigmoid by a two-stage operation and complete cystectomy with closure of the wound by fascia (Figs. 1 and 2), as the third and last stage. The dangers of this method are: (1) peritonitis, as the operation is usually intraperitoneal, and (2) an ascending pyelitis from the bowel. Most of the twenty-seven patients not operated on were too young; a few were too old, or had renal complications, such as hydro-ureter, hydronephrosis, or atrophic kidney. The best time for operation is between the fifth and tenth year of age.

The justification of the operation, with its attendant 20 per cent mortality risk, is the fact that if the condition is left alone 75 per cent of the patients will die before they are 30 years of age, while if treated, they are relieved of a most distressing condition.

FRANK S. SCHOONOVER, JR., M.D.

Bagger, S. V.: Sigmoidovesical Fistula Following Chronic Sigmoiditis (Ueber Sigmoid-Blasen fistel als Folge chronischer Sigmoiditis). *Hosp.-Tid.*, 1921, lxiv, 424, 433.

Bagger gives a detailed description of two cases in which a sigmoidovesical fistula developed during a chronic sigmoiditis or perisigmoiditis. These fistulae were typical examples of so-called acquired internal intestinal fistulae, i.e., communications persisting for

a considerable length of time between the intestinal canal and a hollow organ or an excretory duct. The connection of the intestinal lumen with another organ (for example, a fistula between the intestine and an abscess of the liver) is an incomplete fistula. Many cases of incomplete and complete fistulae between the intestine and neighboring organs are described in the literature.

According to their etiology, these fistulae are traumatic or non-traumatic. The first group is made up chiefly of those due to projectile or stab injuries and those following operation. Foreign bodies which perforate the intestine (needles, chicken bones, fish bones) are not infrequently given as the cause of fistula formation. Among non-traumatic fistulae, those arising from a carcinoma of the digestive tract are the most common. Tuberculosis and syphilis are rarer etiological factors. Ammentorp has described a case in which a fistula formed between the appendix and bladder secondary to actinomycosis. Cystitis and pericystitis are often the cause of fistula and usually in such cases the fistula leads into the rectum. The most frequent etiological factors are general inflammatory processes in the intestines, such as typhoid fever, dysentery, and other varieties of ulcerating enterocolitis, and chronic inflammation in the region of the caecum, appendix,

and sigmoid. The causative sigmoiditis is due usually to faecal irritation and diverticulum. As a rule the fistulae are single, but Bruchet reported a case in which six fistulous openings—two vesical and four intestinal—were demonstrated.

The symptoms of the cause, those of the fistula itself, and the secondary symptoms must be distinguished. The three chief symptoms due to fistula are pneumaturia, the admixture of faeces with the urine, and the presence of urine in the stool. Pneumaturia is recognized by emergence of air through the urethra before, during, and at the close of urination. Immediately after the formation of the fistula the entrance of faeces into the urine is not sufficiently great to establish a faecaluria, but the picture of an increasing cystitis (leucocytosis) develops until finally the abnormal constituent is revealed by its odor. The admixture of urine with the stool is noted chiefly in a chronic diarrhoea. A few cases have been described in which the sphincter ani took over the function of the sphincter vesicae so that the patient could give escape to the urine voluntarily without defaecation.

The secondary symptoms are chiefly disturbances occasioned by the cystitis, urethritis, and pyelonephritis. The diagnosis is usually not difficult, but it must be borne in mind that the presence in the urine of bacteria forming hydrogen sulphide may cause a faecal odor when there is no communication between bladder and intestine. In some cases the administration of charcoal, lycopodium, etc., by mouth and of enemas of milk or some dye has been of aid. Cystoscopy or rectoromanoscopy usually give the necessary information.

Of great prognostic importance are the changes shown by the bladder, the urethra, and particularly the kidneys. The epithelium of the bladder is frequently very resistant, but sometimes there is a true necrotic cystitis. Guyon and Hilzenreiner claim that pyelonephritis is more rare than is generally believed. In both of Bagger's cases there was severe pyelonephritis. In a few cases spontaneous healing is said to have taken place, but as a rule surgical treatment will be necessary. In one case Hepner exposed the fistulous passage, pinched it off, and invaginated one stump in the sigmoid and the other in the bladder.

SAXINGER (Z)

Corbus, B. C.: The Treatment of Tumors of the Bladder Without Local Excision: An Experimental and Clinical Study. *Surg., Gynec. & Obst.*, 1921, xxxiii, 517.

Electrocoagulation of the normal bladder wall of the dog by diathermy is followed by distinct, uniform tissue reaction.

The immediate effect is a slow cooking through of the underlying tissues. The effect upon the deeper structures is the same as that upon the mucosa. This action is followed by an aseptic death of the submucosa and muscularis. Round-cell infiltration is marked only for the first three days. Eventually the entire area is replaced by a dense proliferation

of fibrous tissue, the line of demarcation between the treated area and the surrounding normal tissue being definitely preserved.

The ureteral wall may be turned back in the dog almost to the entrance of the intramural portion. The results have shown no derangement of function in the ureteral activity or the contractibility of the bladder. No obstruction to the ureteral outflow occurred in five months.

The author cautions against the excision of a piece of tumor when it may cause transplantation metastasis. If tissue must be removed for diagnosis, the cautery method should be used. In the large majority of cases, cystoscopy, palpation, and X-ray examination give all the positive information necessary.

In cases of benign papillomata in which the growths are few in number and easily accessible, transurethral fulguration is used and followed by the transurethral application of radium with a special applicator.

For multiple benign papillomata and tumors inaccessible through the urethra, Corbus employs suprapubic fulguration with diathermy and follows it by the application of radium through the suprapubic fistula by means of a special radium applicator.

Carcinomata are treated by the same method as multiple papillomata except that the diathermy coagulation is more extensive and radium is applied more intensively.

The author describes the preparation of the operating table and the proper adjustment of the wires from the electrodes to avoid short circuiting.

The anaesthetic recommended is morphine and scopolamine with gas oxygen. Ether anaesthesia is extremely dangerous because of the short-circuiting of the current.

Diathermy is absolutely bloodless if a flat or blunt electrode is employed. If properly applied, it insures not only total destruction of the mass but also sufficient coagulation of the tissues in the immediate neighborhood to minimize the possibility of cell implantation. Adjacent vascular structures are sealed, the absorption of infection being thereby lessened and the period of convalescence shortened. The fact that the postoperative shock is minimized is of particular advantage if the patient is of advanced age. Of greatest importance, however, is the density of the scar tissue resulting from the employment of diathermy in the treatment of malignant disease. The body defense against carcinoma metastasis lies in the formation of a connective-tissue capsule. The scar tissue formed after a diathermy burn is more dense and spreads farther into the surrounding tissue than that following a cutting operation, and this constitutes an extensive reinforcement of the body's attempt to throttle the embryonic cell.

The author's cystoscopic radium applicator is described and shown in several illustrations.

E. F. HESS, M.D.

Judd, E. S.: Adenomyoma Presenting as a Tumor of the Bladder. *Surg. Clin. N. Am.*, 1921, i, 1271.

Judd reports the case of a single woman, aged 34 years, who complained of lower abdominal pain. Four years before coming to the Mayo Clinic for examination she had had a pelvic tumor and her appendix removed, and two years following this operation a hysterectomy had been performed. For four or five years she had had frequent and painful micturition, with straining and more severe pain at its termination.

Physical examination disclosed a somewhat fixed and tender mass in the right side of the pelvis. Cystoscopic examination revealed a tumor of the bladder involving the right side of the trigone, the right ureteral meatus, and the right wall of the bladder. The tumor seemed to be entirely covered with normal mucous membrane.

On account of the patient's suffering, operation was undertaken in the hope of removing the growth. A diffuse infiltrating tumor was found in the right side of the pelvis, involving the wall of the bladder and extending to the large muscles just inside the bony pelvis. The right ovary contained a cyst and, with the tube, was adherent to the tumor. The neoplasm protruded into the bladder but the vesical mucous membrane was intact. The right ureter was dilated above the growth and disappeared into it. With considerable difficulty the growth was removed with the lower ro cm. of the right ureter and the right lower quadrant of the bladder. The patient was dismissed from the hospital in six weeks, in good general condition and with the wound completely healed. Today, two years after the operation, she is entirely well and working. The bladder function is normal. The kidney with ligated ureter has given no trouble.

The tumor was an adenomyoma of the bladder wall 8 cm. in diameter. A smaller growth, apparently a separate adenomyoma, was found in the fallopian tube.

G. S. FOULDS, M.B.

Smith, G. G.: Radical Treatment of Cancer of the Bladder. *J. Urol.*, 1921, vi, 173.

Squier, in 1914, and Beer, in 1921, emphasized the importance in bladder surgery of a long incision to make allowance for wide retraction, mobilization of the bladder, cauterization of the tumor surface on presentation, removal of the tumor and the searing of all raw surfaces with the cautery, and bathing of the wound with alcohol.

In 1915 Garder collected 666 cases in which operation was performed for bladder tumors. Of these, 43.7 per cent showed recurrences following partial resection, while 88 per cent showed recurrences after excision alone. When metastasis has developed, curettage followed by cauterization gives relief. Radium was used in twenty-four cases of inoperable cancer with only fair success. Schmitz had the same experience. Radium is of value in cases of small multiple growths too widely scattered for resection.

When partial cystectomy is not indicated the ureters should be transplanted and the entire bladder removed or extensively treated with radium. Uretero-enterostomy is more satisfactory to the patient than lumbar nephrostomy or ureterostomy. The early results of uretero-enterostomy were not encouraging. Since Coffey's work in 1911, in which he demonstrated his so-called "physiological implantation," the results have been more favorable as is evident from the reports of the Mayos.

Implantation within the bony pelvis is a technically difficult operation. The ureters should be implanted at different times according to the technique of Coffey. When partial cystectomy cannot be performed, ureteral implantation followed by total cystectomy or the use of large doses of radium is the operation of choice. The mortality will be high but a small percentage of cases will be cured.

C. D. PICKRELL, M.D.

GENITAL ORGANS

Judd, E. S., Bumpus, H. C., Jr., and Scholl, A. J., Jr.: The Prognosis in Cases of Carcinoma of the Prostate Discovered at Operation. *Surg. Clin. N. Am.*, 1921, i, 1279.

Carcinoma of the prostate treated surgically is of three types: (1) the carcinomatous changes which, although undoubted, are deemed sufficiently early to warrant an attempt at surgical removal, (2) suspected carcinomata which cannot be diagnosed positively, and (3) the type discovered at operation. It would naturally be supposed that the prognosis in the last type would be the best, and that in the first type the poorest.

In order to determine whether or not the form of operation had any bearing on the final results, the patients were grouped according to whether the operation was suprapubic or perineal. Seventy-five patients were operated on by the suprapubic route. Eleven (14 per cent) of these lived more than three years following operation. Forty-two patients were operated on by the perineal route, and five (12 per cent) have survived more than three years. Three years is not used arbitrarily as a unit of measure, but because in studying a series of 231 untreated patients 34.59 months was found to be the average duration of the disease, and obviously with any form of surgical or radium treatment a considerable number of the patients treated must live longer than three years if the treatment is to be regarded as of any value.

Sixty-six of the seventy-seven patients in whom cancer was either diagnosed or suspected prior to operation have been traced. Of these, only eight (12 per cent) have lived more than three years, a result indicating that if carcinoma of the prostate has progressed sufficiently to be recognized clinically surgery offers no better results than radium.

Of still greater interest are the data obtained from the group of sixty-two patients in whom the malignancy was so obscure as to escape clinical detection

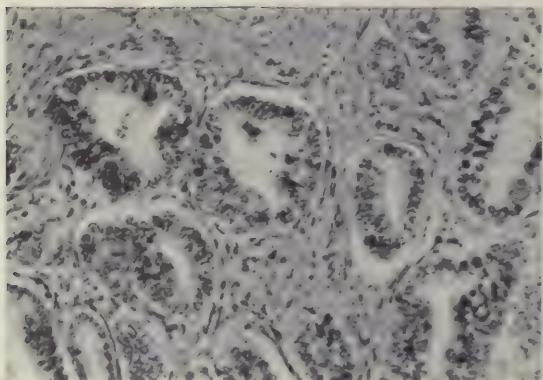


Fig. 1. Type 1 glandular carcinoma of the prostate ($\times 100$).

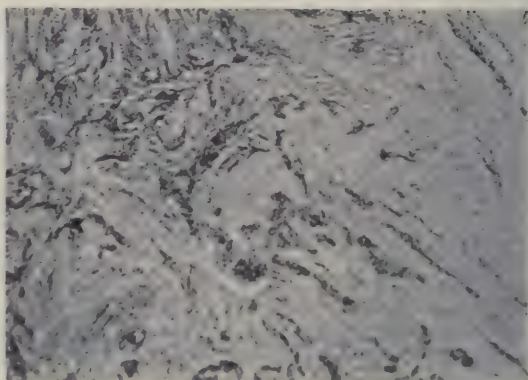


Fig. 2. Type 2 carcinoma of the prostate. Marked fibrosis. Deeply stained malignant cells scattered through stroma with practically no gland formation ($\times 50$).

and was discovered only at operation or after careful examination of the gland microscopically. The authors have completed records of fifty-one of these patients, eight of whom (15 per cent) lived more than three years.

Pathologically and clinically there are two types of prostatic cancer but of course there are also intermediate states. This division was such as to afford a very valuable prognostic aid. The first type (Fig. 1) is the more common, and its degree of malignancy is lower than that of the second type (Fig. 2). The cells are partly differentiated, fairly regular in size and shape, and retain the long-tufted end projecting into the glandular lumen which is the most significant feature of prostatic epithelium. The nuclei are round, relatively larger than the nucleoli found in normal or hypertrophied glands, and contain the distinct nucleoli which are so prominent in undifferentiated cells. Clinically these prostates are large, nodular, and stony, and produce the symptoms of obstruction first calling attention to their presence. The second type of cancer, which does not retain the usual prostatic gland structure, is often confused with lymphocytic infiltration. The malignant cells that have migrated into the stroma often show a streaked or etched-out appearance in contrast to the clumped localized disposi-

tion of lymphocytic infiltration. The cells in such glands, either from morphologic or mechanical influences, have lost their original structure; they do not conform to the usual type, but vary in size and arrangement. These may comprise great masses or extending wedges of tightly packed cells containing large, deeply staining nuclei. In other cases the cells may be loosely arranged, separated, and supported by a small amount of connective tissue.

In 100 of the 146 cases in this series it was possible to correlate the histologic findings with the postoperative course. Forty-four cases were of Type 1. Eleven of these patients lived more than three years; twenty-two are still alive, one after six years, two after five years, four after four years, three after three years, six after two years, and six after one year. Fifty-six cases were of Type 2. Sixteen patients lived two years, seven lived three years, and only one lived more than three years. Three patients are still alive, one three years, and two, one year after operation.

It seems evident, therefore, that in cases of cancer of the prostate the degree of malignancy as demonstrated microscopically determines the prognosis, and that when the disease has advanced sufficiently to be recognized clinically the possibility of surgical cure is diminished.

G. S. FOULDS, M.D.

SURGERY OF THE EYE AND EAR

EYE

Lillie, W. I.: Ocular Phenomena in Cases of Chiasmal Lesions Not of Pituitary Origin: Report of Six Cases. *Surg. Clin. N. Am.*, 1921, i, 1363.

The early ocular changes produced by lesions of pituitary origin may be summarized as follows: (1) lowered visual acuity in one or both eyes, (2) characteristic changes in the visual fields, and (3) waxy pallor of the nerve heads without loss of substance.

The progressive field changes which are due to chiasmal lesions of pituitary origin have been divided into four main groups: (1) bitemporal, (2) homonymous, (3) amaurotic, and (4) unclassified. The field changes are classified also according to the progression and type of change: (1) changes in the color fields, (2) changes in the form fields, and (3) bizarre fields, such as scotomatous fields.

The six cases reported in this series were selected from a group of thirty cases of chiasmal lesions for which operation was performed in the Mayo Clinic in the past twenty months. They are reported in order to show the striking similarity in the ocular phenomena of chiasmal lesions not of pituitary origin. The remaining twenty-four cases of this group were cases of pituitary tumor.

The six cases were those of three males and three females whose ages ranged from 20 to 45 years. The visual symptoms varied in duration from six months to six years and were generally out of proportion to the fundus findings. Vision could not be improved with glasses and was normal in only one case. In most cases it had either failed entirely or amounted only to the ability to count fingers. The ophthalmoscopic examination of the disks in two cases showed a pallor with loss of substance which is not typical of pituitary tumor. In the other four cases the disk changes could not be differentiated from those of pituitary tumor. The visual fields varied from a bitemporal hemianopsia to a homonymous hemianopsia, and in one case there was preservation of the upper temporal quadrant which is not typical of pituitary tumor. Roentgenograms showed the sella to be normal in three cases and enlarged, Grade 2 to 4, in three cases. In only two was there any evidence of thinning or destruction of the posterior clinoids. The general examination was negative in four cases, and in two the neurological examination revealed definite changes. In one case definite localization was possible only by neurological examination.

The pathologic conditions found at operation were: (1) malignant basal-cell tumor, (2) glioma of the midbrain, (3) basal-cell endothelioma, (4) psammoma of the meninges, and (5) basal-cell

glioma arising from the right temporosphenoidal globe. In the sixth case it was impossible to remove a specimen of the tumor for examination. At operation all the growths were found to be of extra sellar origin, but involved the chiasm.

All of the patients in the series came to the Clinic primarily because of failing vision or complete blindness in one or both eyes.

Definite ophthalmic lesions were found in every case at the time of examination, while only two patients showed definite neurological changes.

The fact that the ocular changes in four of the patients could not be distinguished from those characteristic of a pituitary syndrome shows the necessity for careful examination of the fields and fundus early in the course of the disease in order to detect the progressive changes.

Only one of the patients gave a history of changes in menstruation; in this case uterine fibroids had been treated with radium.

None of the six patients had any evidence of acromegaly. In four cases in which the metabolic rate was estimated it varied from 3 to 27 per cent.

Four patients died and two autopsies were obtained. Nothing has been heard from the remaining two with regard to changes in vision and fields.

Black, N. M.: Eye Findings in Brain Injuries. *Am. J. Ophthalm.*, 1921, iv, 819.

Extra-ocular conditions associated with brain injuries include muscle paralysis, nystagmus, and conjugate deviations.

Among intra-ocular conditions are affections of the optic nerve head and retina; affections of the pupil, including miosis, mydriasis, anisocoria, hippus, and the Argyll-Robertson pupil; an increase or decrease of intra-ocular tension; and subjective findings in the visual fields.

The author discusses choked disc in some detail.

THOMAS D. ALLEN, M.D.

Knapp, A.: The Action of Adrenalin on the Glaucomatous Eye. *Arch. Ophthalm.*, 1921, i, 556.

The author's observations were based on a series of sixty-five cases of primary glaucoma, some of which had been operated on. Cases of atrophic iritis and posterior synechia were excluded.

The pupil dilated in sixty cases, but the degree of mydriasis was not so great as if pilocarpine had been given previously.

The tension was unaffected in forty cases, decreased in twenty, and increased in five. In Knapp's opinion the reduction in tension is due probably to the freeing of the edge of the iris from the anterior surface of the lens and the consequent easier flow

of aqueous from the posterior to the anterior chamber.

In fifteen cases the glaucoma affected only one eye. The normal eye reacted to adrenalin as follows: in twelve the pupil dilated, in three there was no change in size, in twelve the tension was unaffected, and in three the tension was reduced. "This suggests that a susceptibility to adrenalin may be present, long before the usual clinical signs of glaucoma." **THOMAS D. ALLEN, M.D.**

Benedict, W. L.: The Character of Iritis Caused by Focal Infection. *Arch. Ophthalm.*, 1921, 1, 560.

In an investigation to determine the character of iritis caused by focal infection, fourteen cases of iritis in which other possible causes of the condition were eliminated were selected as test cases. Five of these were acute and nine were chronic. Injection of cultures from foci in patients with acute iritis produced acute iritis in rabbits in four instances, but iritis was not produced by the injection of cultures from foci in chronic or inactive cases.

The iritis produced in rabbits ran the same course as that in the patients from whom the cultures were taken. It was caused by streptococcus viridans of the short-chain type and the infection was carried by the blood stream. The specificity of the cultures of the organism for iritis is influenced by aerobic conditions of the culture medium. In order to retain a specific affinity the organism must be grown under conditions of oxygen tension similar to those to which they are accustomed.

Iritis due to focal infection is a myositis caused by an organism that at some period of its growth may produce iritis, and at other periods, inflammation of some other muscle. It involves the portion of the muscle of the iris corresponding in location to that of the muscle infection in arthritis. This affinity for the tissue of the iris becomes a function of the organism spontaneously or may be acquired by its growth on iris tissue. The organism's affinity for the iris is easily lost when it is grown in different environments; it will change its affinity for special structural tissues or even lose its virulence to a marked extent.

R. O. GRIGSBY, M.D.

Smith, H.: The Treatment of Cataract. *Arch. Ophthalm.*, 1921, 1, 515.

This is Smith's answer to adverse criticism of the Smith Indian operation. Iritis, Smith believes, is due merely to capsule and not at all to lens matter, as in a case of his own in which lens matter was left in the wound through premature rupture of the capsule iritis did not develop following the complete removal of the capsule. Moreover, iritis does not occur in Smith's cases nearly as frequently as in those of others who use the capsulotomy method. After-cataract he does not have to contend with at all. With regard to the incision he states that hemisection of the cornea does not interfere with its nutrition. In the intracapsular operation iridectomy is not necessary.

A skilled operator should have no more than 7 per cent vitreous loss by the Smith method. The loss of one-third of the vitreous is not followed by serious consequences, particularly if there is no subsequent iritis or iridocyclitis. In iridectomy cases the pillars are not tied down by adhesions to the capsule; consequently there is no keyhole or drawn-up pupil.

As in other surgical procedures, the use of daily dressings is meddlesome and complications are best left alone.

THOMAS D. ALLEN, M.D.

Benedict, W. L.: Retinitis of Acute Nephritis: Report of Six Cases. *Med. Clin. N. Am.*, 1921, v, 275.

The visible changes which take place in the retina as the result of impairment of the function of the kidneys are characteristic of the change within the kidneys and indicate to some extent its quality and quantity. Kidneys which have been inflamed repeatedly or continuously for months or years may suddenly be overwhelmed by an attack that will seriously impair or arrest their function. Such an attack leads to changes in the retina which are best termed the "retinitis of acute nephritis."

The ophthalmoscopic picture of the retina of acute nephritis is not always accompanied by changes in the urine or blood chemistry, and nephritis may be overlooked or denied on evidence that can be deduced from laboratory tests. The findings of this type of retinitis indicate that, within a short time, the patient has suffered from impairment of renal function to such an extent that changes have been produced in the eye. These attacks may be brought on by exposure to inclement weather, dietary indiscretions, infection, or stone in the kidney.

Case 256254. A woman, aged 47, was examined at the Mayo Clinic January 15, 1919. For eight days previously she had had frequent voiding, but no other symptoms of nephritis. The systolic blood pressure was 210, the diastolic 120. Examination of the urine was negative and the phenolsulphonephthalein test of renal function was 50 per cent. The fundus oculi showed marked changes of hypertension. February 5, 1921, she came to the Clinic for re-examination. Two months previously her tonsils had been removed, and since then she had suffered from headache, backache, nausea, and vomiting. The systolic blood pressure was 220, the diastolic 124. The phenolsulphonephthalein test of renal function was 55 per cent. Examination of the urine was negative. Vision was 6/6 in both eyes. Retinitis of acute nephritis was diagnosed after ophthalmoscopic examination. February 19, the phenolsulphonephthalein return was 70 per cent. The blood pressure had been reduced to 164 systolic and 108 diastolic. At the time of the patient's dismissal from the hospital she had good renal function, normal blood urea, and no albuminuria. The retinitis had disappeared except for evidences of hypertension. The retinitis observed in this instance was characteristic of the lesion produced by

a renal break in a case of high blood pressure of varying degree which had been present for several years and had produced a moderate sclerosis of the retinal arteries.

Case 344317. A man, aged 40, came to the Clinic for examination December 21, 1920. December 27, the nerve heads of both eyes were found to be markedly swollen (about 6 or 7 diopters) but there were no other characteristic signs of acute retinitis. Examination of the urine was negative. There were 25 mg. of urea per 100 c.cm. The phenolsulphonephthalein return showed 55 per cent and 50 per cent. During the next three weeks the phenolsulphonephthalein tests gave returns of 40 per cent, 25 per cent, and 20 per cent. The retinitis increased rapidly. The retinae became detached. Blood pressure was increased to 240 systolic and 140 diastolic. This was considered a marked case of hypertension on a nephritic basis.

Case 346351. A man, aged 54, was examined at the Clinic January 13, 1921. Ophthalmoscopic examination showed some retinal arteriosclerosis, but no definite exudates or hemorrhages. January 21 early signs of retinitis of nephritis were found. The blood pressure was increased although the blood urea was not above normal. Phenolsulphonephthalein tests gave returns of 20 per cent, 30 per cent, and 35 per cent. The patient improved, but the retinitis increased for a few days before it subsided. February 18, the patient suffered an attack of nausea with fever and chills. Two days later there were 84 mg. of blood urea per 100 c.cm. although the blood pressure was not elevated. The phenolsulphonephthalein excretion was 32 per cent. A few days later the eye grounds in both eyes showed, besides the vascular condition, areas of exudate. The uræmic symptoms, which came on about February 18, were attributed to blockage of the right kidney by a stone. During observation in the hospital, the phenolsulphonephthalein test showed improvement of kidney function, a little more than 50 per cent being returned. By April 16 the fundus had resumed its usual appearance. In his observation of this case the author was fortunate to have for reference full clinical data and laboratory reports on the urinalysis and chemical examinations of the blood, both after and before a decided break in the function of the kidney.

Retinitis of acute nephritis occurs when the renal function has been impaired. It indicates that there has been an accumulation of products ordinarily eliminated by the kidney which are loading the blood to the detriment of body tissues. If this accumulation reaches beyond bodily tolerance, either in amount or time, the results will be registered in tissue damage of a proportionate degree. Regardless of what else may befall the retina, the presence of these substances in the blood produces changes characteristic, if not pathognomonic, of nephritis, and the cases reported herein indicate that with the lessening of the elimination by the kidneys there is an increase in the severity of the retinitis.

EAR

Broders, A. C.: *Epithelioma of the Ear; a Study of Sixty-Three Cases.* *Surg. Clin. N. Am.*, 1921, i, 1401.

A prognosis with regard to a neoplasm should never be attempted without some knowledge regarding its microscopic nature, its size, and its location. In the series of sixty-three cases studied three types of epithelioma of the ear were encountered, namely, basal-cell epithelioma, squamous-cell epithelioma, and melano-epithelioma.

Basal-cell epithelioma is the least malignant and melano-epithelioma the most malignant. If an epithelioma showed three-fourths differentiation or keratinization and one-fourth undifferentiation, it was graded 1. If the amounts of differentiated and undifferentiated epithelium were equal, it was graded 2. If the undifferentiation formed about three-fourths of the growth, it was graded 3, and if there was no differentiation it was graded 4. Grade 4 squamous-cell epithelioma is about as malignant as melano-epithelioma, while the basal-cell epithelioma is slightly less malignant than a squamous-cell Grade 2.

Of the sixty-three patients, 76.19 per cent were males, and of these, 64.44 per cent were farmers. The average duration of the tumor was 4.11 years, and the average maximum diameter 3.22 cm. Eighty-four and twelve hundredths per cent of the lesions were on the auricle, 14.28 per cent in the canal, and 1.58 per cent in the middle ear.

Thirty-nine and sixty-eight hundredths per cent of the patients had had non-surgical treatment, 28.57 per cent had had surgical treatment, and 53.68 per cent had had a combination of treatments before entering the Mayo Clinic.

In fifty-six cases the growth was operable and in seven inoperable. In 92.85 per cent of the operable cases the treatment was surgical, and in 7.14 per cent radium was given. Forty-six and fifteen hundredths per cent of the patients treated surgically were given radium treatment also. Radium or X-ray treatment was given in the inoperable cases.

Sixty-one and thirty-nine hundredths per cent of the epitheliomata were of the squamous-cell type, 33.33 per cent of the basal-cell type, and 4.76 per cent melanotic. Of the squamous-cell type, 5.12 per cent were Grade 1, 66.66 per cent Grade 2, 23.07 per cent Grade 3, and 5.12 per cent Grade 4.

Eighty-five and seventy-one hundredths per cent of the seven patients had metastasis in removed lymph nodes. Involvement of the lymph nodes and salivary glands was: parotid lymph nodes, 50 per cent; external jugular nodes, 50 per cent; parotid glands, 33.33 per cent; submaxillary lymph glands, 16.66 per cent; superior deep cervical glands, 16.66 per cent; and inferior deep cervical nodes, 16.66 per cent.

Forty-seven and five hundredths per cent of the patients are alive with good results. The average

duration of life was 3.53 years; 20.58 per cent are alive with fair results after an average life of one and sixty-three hundredths years.

In the cases of melano-epithelioma 100 per cent poor results followed treatment.

Fifty-eight and thirty-three hundredths per cent of the patients with basal-cell epithelioma are alive with good results, 25 per cent are alive with fair results, and 16.66 per cent are dead.

Forty-five per cent of those with squamous-cell epithelioma are alive with good results, 20 per cent are alive with fair results, and 35 per cent are dead.

Of the patients with squamous-cell epithelioma of Grade 1, one died (50 per cent). Of those with Grade 2 neoplasms 50 per cent are alive with good results, 25 per cent are alive with fair results, and 25 per cent are dead, the results having been poor. Of those with neoplasms of Grade 3, 42.85 per cent are alive with good results 14.28 per cent are alive

with fair results, and 42.85 per cent are dead. All of those with neoplasms of Grade 4 are dead.

All of the cases with metastasis had poor results, and all of those without metastasis had good results. Of the patients who did not require the removal of regional nodes or salivary glands 53.33 per cent are alive with good results, 26.66 per cent are alive with fair results, and 20 per cent are dead, the results having been poor.

Of the patients with lesions of the auricle 51.61 per cent are alive with good results, 16.12 per cent are alive with fair results, and 32.25 per cent are dead. Sixty-six and sixty-six hundredths per cent of those with lesions in the external auditory canal are dead.

Of seven inoperable cases five were fatal. The lesions were located on the auricle in three cases, in the canal in three, and in the middle ear in one.

FRENCH K. HANSEL, M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Lillie, H. I.: Observations in the Management of Chronic Frontal Sinusitis with External Manifestations: Report of Twenty-Two Cases. *Surg. Clin. N. Am.*, 1921, i, 1381.

The material for this study consisted of twenty-two patients observed in the Mayo Clinic, all of whom had external manifestations of frontal sinus disease. Sixteen had discharging fistulae, five had subperiosteal abscesses, one showed evidence of mucocele, and all but four of them had had some extranasal operation. In only three instances was the pathologic condition shown by the roentgenogram.

In such cases the two-stage operation is employed. First, an intranasal operation is performed under local anaesthesia to enlarge the nasofrontal duct and exenterate thoroughly all diseased sinuses of the nose. Special care is taken in flattening the lateral wall of the agger nasi and in smoothing off all rough edges to lessen the formation of granulation tissue. As a general rule the external operation is performed about ten days after the intranasal operation. Modifications of the Killian operation performed under general anaesthesia are used in most cases. Special care is taken to eradicate all pockets and overhang and to smooth the inner table. All mucous membrane lining the frontal sinus is removed. The upper edge of the outer table is beveled to lessen the deformity and eliminate pocketing. The upper wall of the orbit is removed as far as necessary to uncover any lateral ethmoid cells; these are found frequently. In case a double frontal operation had been performed previously, the nasofrontal duct regions are joined somewhat after the method suggested by Lathrop. Vaseline gauze is used for packing and allowed to protrude through the nose. The external incision is closed with interrupted silkworm suture.

In all cases previously operated on the operation had failed because of incomplete removal of infected pockets and overhang. In five cases the outer table had been broken through by erosion: in three cases into the orbit and in two over the forehead. In three cases a definite hypertrophic osteitis had developed.

The postoperative care consisted entirely of keeping the nasal cavities clean, generally by the use of the suction apparatus. Packs were removed on the third day. There were four cases of diplopia, three of which cleared up in one week. Three patients had well-marked chemosis. Meningitis occurred in one instance as the result of fracture of the inner table in a case of hypertrophic osteitis.

H. E. BOZER, M.D.

Barlow, R. A.: Observations on the Sphenopalatine Ganglion Syndrome of the Sympathetic Type: Report of Three Cases. *Med. Clin. N. Am.*, 1921, v, 289.

The author discusses the clinical manifestations and treatment of sphenopalatine disturbances and reports three typical cases treated by him at the Mayo Clinic. Irritation of the sphenopalatine ganglion so closely simulates the repeated paroxysms of sneezing occurring in hay-fever that some cases of this condition have been incorrectly diagnosed.

The sphenopalatine ganglion is the most superficial sympathetic ganglion in the body and consists of fine interlacings of fibers with neurones from the sympathetic system. The preganglionic and postganglionic fibers compose the efferent nerve mechanism. The superficial position of the ganglion renders it vulnerable to external stimuli such as infection in the nasal chamber, dust, cold air, etc.

Sphenopalatine disturbances are of two types: the neuralgic and the sympathetic. Patients with neuralgic disturbances complain of severe lower-half headaches. Patients with sympathetic disturbances have persistent sneezing, lachrymation, and attacks resembling hay-fever which are not dependent on season or climate.

The treatment of the condition is very simple. The nasal ganglion is first cocaineized by passing into the nose to the posterior end of the middle turbinate an applicator with cotton dipped in 10 per cent cocaine. This is withdrawn and a second applicator, dipped in sterile water, is inserted to the same spot and allowed to remain about one minute. This procedure rules out functional disturbances. If the first treatment is without effect by the second day, cocaine is applied again. This time the second applicator is dipped in 50 per cent silver nitrate solution instead of sterile water and allowed to remain in position about thirty seconds. The treatment is applied to both sides and is usually followed by severe attacks of sneezing. About the third day it is repeated. As a general rule two treatments are sufficient.

The ganglion could be injected with alcohol as in the neuralgic types of nasal ganglion disturbances, but the silver nitrate treatment is equally efficacious as silver has a certain selective action on nerve tissue. Moreover, the application of silver is less technical than the injection of alcohol and less apt to be followed by complications.

Frank, I., and Strauss, J. F.: An Invisible Scar Method in Cosmetic Nasal Surgery. *Ann. Otol., Rhinol. & Laryngol.*, 1921, xxx, 670.

For the correction of nasal defects the authors prefer the external to the internal operation as in

the former the field can be sterilized so that the chance of infection is greatly lessened and the operative field is larger.

The external operation has been so modified that the usual broad scar is now hardly noticeable. Moreover, the surgeon can operate successfully upon the three types of bridge deformity through an incision made in a field readily sterilized and in a hidden location so that there is no need for anxiety if a pigmented scar persists. The technique is as follows:

The patient's head and face are thoroughly washed before he is taken to the operating room. With an indelible pencil, a line $\frac{1}{4}$ in. in length is drawn on the horizontal axis of the eyebrow, as close to its median extremity as possible without extending beyond the hair line. The brow is then partly or wholly removed with the scissors, the pencil-marked location of the incision on the skin being left plainly visible. On the operating table the eyes are covered with sterile cotton pads and the remainder of the face is sponged with ether-alcohol.

The incision is made $\frac{1}{4}$ in. in length, down through the periosteum to the frontal bone. A periosteal elevator with a slightly curved shank is then introduced and the skin and subcutaneous tissues are elevated from the bone and cartilage along the median line of the bridge of the nose down to the tip, the instrument being guided in its course by the operator's hand. Into the pocket thus formed a slightly curved rasp is introduced and all humps are removed. In a case of depressed nose a properly prepared transplant of bone or cartilage is inserted.

For the broad nose two incisions are necessary: the usual one in the left eye and another similarly placed on the right side. Through these openings the periosteum covering the frontal process of the superior maxillæ is elevated and a small, specially designed saw is inserted. The processes are then sawed through at the base of the nasal bridge and the walls of the nose are pressed inward to a position cosmetically satisfactory and retained with an external splint of padded heavy sheet copper. The incisions are closed with interrupted horsehair sutures and sealed with tincture of benzoin over thin cotton.

J. C. BRASWELL, M.D.

New, G. B.: Rhinophyma; Rhinoscleroma. *Surg. Clin. N. Am.*, 1921, i, 1393.

The case of rhinophyma reported was that of a man aged 60 years, who had a huge growth on the tip of the nose which had begun eighteen years before and had gradually become larger. The patient was a heavy drinker, and had had syphilis thirty-five years before, but had not been treated.

Examination revealed an irregular, soft, nodular tumor 4 cm. in diameter on the tip of the nose and thickening of the alæ. Previous to operation, which was performed under ether anaesthesia, a tertiary syphilitic lesion on the left hand was treated.

In 1919, the author published an article drawing attention to the treatment of rhinophyma by decor-

tication. Plastic flaps or grafts are not necessary after this procedure. The left index finger should be inserted into each nostril to prevent paring through into the nose. Hot packs and vaseline dressing control oozing, and the use of the electric bulb dries the secretions. In a few days little islands of epithelium will be noticed over the denuded area. These are formed from the cut ends of the hypertrophied ducts, and in two weeks the area is well covered with epithelium. The cosmetic result is all that could be desired.

The case of rhinoscleroma reported was that of a farmer, 27 years of age, who was born in Russia and came to the Clinic because of enlargement of the nose and nasal obstruction. The condition had been noticed one year before, following an injury due to the kick of a horse. The injury was not severe, but soreness and swelling, a foul discharge, and gradual nasal obstruction developed. During the first six months after the injury there was very little enlargement of the external nose.

Examination revealed granulomatous masses filling each nostril. The external nose was three times its normal size. The meatus were occluded and the soft palate was retracted upward. The nasopharynx contained granulomata but no ulceration. The condition was diagnosed rhinoscleroma on the basis of the clinical, bacteriologic, and microscopic examination of the tissue.

Fifty milligrams of radium were inserted into each nostril for four hours each, and 50 mg. into the nasopharynx for six hours. One month later similar treatment was applied to the nose, and two months later the nasopharynx was treated for four hours with 66 mg. of radium. The condition was clinically cured. This is the third case in which radium was used with striking results.

Rhinoscleroma is a granulomatous neoplasm which affects the nose, nasopharynx, larynx, and trachea, and is due to a micro-organism similar to, if not the same as, the bacillus of Friedlander.

At one time the condition was seen only in Central Europe, but today seems to occur in all parts of the world.

FRENCH K. HANSEL, M.D.

THROAT

New, G. B.: The Treatment of Multiple Papillomata of the Larynx in Children. *Ann. Otol., Rhinol. & Laryngol.*, 1921, xxx, 631.

The treatment of multiple papillomata of the larynx in children has always been difficult because of the tendency to recurrence. Many methods have been employed, such as tracheotomy, thyrotomy, and cauterization, endoscopic operative measures, fulguration, the application of various drugs locally, and X-ray and radium treatment. During the past six years the author has employed radium both within the larynx and outside of the neck and has obtained results more satisfactory than those given by other methods.

Mackenzie, Clark, and Smith have stated that

they believe tracheotomy to be the most efficient method of treating these cases. While the value of tracheotomy is well known, cases are reported in which the patients have worn tubes for years without any improvement. Polyak discussed the use of radium as a substitute for operative measures. Abbe, in 1898, was the first in this country to treat multiple papillomata of the larynx with radium. Several observers have reported poor results from the use of radium, but on the whole the outcome seems to be quite good. Lynch's suspension apparatus has added a great deal to the efficient care of these patients. His results in removing multiple papillomata by operative measures have been superior to all others on record in this country. He now believes, however, that fulguration or the use of acid nitrate of mercury is the best method.

During the years from 1914 to 1920 the author examined at the Mayo Clinic twenty-six children between the ages of 10 and 12 years with multiple papillomata of the larynx. Such patients were usually brought to the Clinic because of hoarseness or shortness of breath which began at the age of 2 or 3 months as a slight wheezing or crowing cough. Sometimes the symptoms do not appear until the age of 3 or 4 years.

Multiple papillomata of the larynx are often diagnosed as laryngismus stridulus, asthma, or enlarged thymus, but these conditions can be ruled out by a carefully taken history. The diagnosis can be made only by laryngoscopic examination.

Many of the patients in this series had been operated on by endoscopic methods. One patient had six thyrotomies and cauterizations which resulted in a marked scarring of the glottis and the necessity of wearing a tracheotomy tube. One patient had six suspensions and the removal of papillomata but when seen by the author the larynx was filled. Nineteen of the patients had tracheotomies previously or shortly after their arrival at the Clinic. Tracheotomy was not performed unless obstruction made it necessary.

The treatment in this series of cases was given under ether by means of the Lynch suspension apparatus. Except in a few of the early cases, no attempt was made to remove the papillomata. A small tube containing radium salt or emanation was inserted into the glottis and was kept moving under observation. From 75 to 150 mg. or mc. of radium were used for from twenty to thirty-five minutes. No screening was employed except the silver tube which was 1 mm. thick. The treatments were given once in six weeks to two months. The patients must be seen at definite intervals. The greatest number of suspensions in one case was six, and the smallest number, one. Besides this treatment, radium was applied outside the larynx, the average dose being 3,000 mg.-hrs., with 1 in. of wood and 2 mm. of lead screening.

Of the twenty-six cases, nine cannot be considered in the results as some were not treated at all and others received only one treatment because they could not return at definite intervals.

Of the seventeen patients regarding whom definite information was obtained, eleven are entirely free from papillomata; nine of these had had tracheotomies and the tube had been removed. The tube is always left in place at least six months after the larynx is free from the growths. One patient had a collapse of the trachea above the opening, but a two-way tube was inserted for a while and later removed. Two of the eleven patients did not have tracheotomies or treatment by suspension because of frequent colds, but were treated by external applications of radium. Six of the seventeen patients are still under treatment, but five during the last year only. Four of these six patients are almost entirely free of papillomata and the voice is fairly good. Three of these four can cork their tubes. In the entire group the author has not seen any poor results from the use of radium. He believes that undoubtedly this is due to the fact that the radium was under direct observation and was kept moving while in the glottis.

FRENCH K. HANSEL, M.D.

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INTERNATIONAL ABSTRACT OF SURGERY

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ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Mosskalenko, W. W.: *The Anatomic-Mechanical Bases of Drainage of the True Pelvis* (Die anatomisch-mechanischen Grundlagen der Drainage des kleinen Beckens). *Inaug.-Diss.*, Petrograd, 1921.

This monograph of 386 pages is based upon the author's very thorough anatomical research on 112 cadavers. Drainage of the true pelvis depends upon: (1) the operative procedure used for the introduction of the drainage tube, and (2) the topography of the pelvic organs.

Mosskalenko discusses from the standpoint of anatomy all the proposed operative methods of effecting drainage and describes the variations of the organs of the true pelvis having an influence on the evacuation of fluids. The cadavers studied were hardened with a 10 per cent solution of formalin. By control experiments it was determined that such hardening does not cause displacement of the organs. The outline of the sacrum and the organs of the pelvis were reproduced on glass in their natural size and position, and in this manner a series of drawings showing the topography of the pelvic organs was obtained.

The cadavers of forty-three men, fifty-six women, and thirteen children were examined. In addition, dogs were dissected. The author gives a detailed description of the aponeurosis of Denonvillier, the posterior and lateral pelvic wall, the pelvic floor, and the topography and variants of the rectum, bladder, urethra, prostate, vas deferens, uterus, vagina, and pelvic peritoneum. On the basis of all the variants certain topographical types of pelvic organs were determined. In his review of the literature the author quotes 311 authors.

The aponeurosis of Denonvillier is of great importance as it indicates the topographical peculiarities of the pelvic organs. It may be either vertical or oblique, i.e., it may lie nearer the symphysis or nearer the os sacrum. Its position is related to the topography of all the pelvic organs. Mosskalenko

differentiates two types of topographical position of the pelvic organs: (1) the symphysopetal type, in which they lie near the symphysis; and (2) the sacropetal type, in which they lean toward the sacrum. In the symphysopetal type the aponeurosis of Denonvillier is inclined against the symphysis, while in the sacropetal type it is inclined toward the sacrum.

On the basis of comparative anatomy one must regard the sacropetal type as the perfect type and the symphysopetal type as the imperfect type. Each of these types points to certain peculiarities in the construction of the individual pelvic organs and is of great importance in the choice of an operative method. In the sacropetal type the route to the prostate, seminal vesicles, and uterus through the anterior abdominal wall is very disadvantageous as the organs lie deep in the true pelvis. The route through the perineum or through the vagina is easier as the organs lie nearer these routes. The topographical type is of importance also in catheterization of the male urethra. In extreme cases of the sacropetal type the catheterization must be undertaken with a slightly bent catheter while in cases of the symphysopetal type the catheter must be decidedly bent. In extreme cases of the sacropetal type the prevesical peritoneal fold lies under the symphysis and high section is difficult to perform without injuring the peritoneum.

The presence of the symphysopetal or the sacropetal type and the position of the aponeurosis of Denonvillier can be ascertained by the ordinary measurement of the pelvis. The conjugata vera is determined in the usual manner. When this is more than 11 cm. and the anteroposterior diameter is more than 11.5 cm., the pelvic topography is of the sacropetal type. If the measurements are less, the type is symphysopetal. A line which forms an angle of 55 degrees with the conjugata vera represents the horizontal line of the pelvis in the vertical position. The angle of 55 degrees indicates the angle of pelvic

inclination to the horizontal line. The aponeurosis of Denonvillier forms two angles with the horizontal line, an anterior and a posterior angle. The posterior angle is termed by Mosskalenko the "angle of the aponeurotic inclination." The average is approximately 113 degrees. In 61 per cent of cases it is greater; in 39 per cent, less.

The form of the sacrum is also of practical importance. The author distinguishes two types of sacrum: the intra-articular type, and the extra-articular type. A line which unites the two postero-inferior spines of the ilium divides the sacrum into two parts. In the extra-articular type of sacrum the extra-articular or lower portion forms the greater part and the articular surface lies above the third sacral foramen. The form of the sacrum is very complex, its curvature slight, and the coccyx short. In the intra-articular type of sacrum the upper or intra-articular portion forms the greater part. The articular surface is sunken beneath the level of the third sacral foramen, and in shape the sacrum is distinguished by its simplicity, its pronounced curvature, and the long coccyx. The type is of great importance in the choice of the operative route to the rectum.

With regard to the pelvic floor the author carefully studied the topography of the ischio-rectal fossa and the recto-urethral trigone. He found that there are two types of ischio-rectal fossa, one pyramidal and the other prismatic. The first is seen chiefly in women and in cases of long perineum; the second indicates a short perineum and is found usually in men. The recto-urethral trigone has either a short height and a long base (Type 1), or the reverse, a great height and a short base (Type 2). From the standpoint of comparative anatomy, the first type is more perfect. It is found in man oftener than in animals. Type 1 is usually present when the angle of inclination of the aponeurosis of Denonvillier is greater than the average.

In his study of the organs of the true pelvis Mosskalenko found two types of rectum: the ampullar and the cylindrical. In the first the ampulla is highly developed. In the second it is not pronounced and the intestine therefore assumes a cylindrical form. The ampullar or perfect type is generally found in man. The type may be determined by measuring the distance between the anus and the coccyx. When this distance is less than 3.5 cm., the rectum is usually of the ampullar type, and when it is greater than 3.5 cm., the rectum is of the cylindrical type. The cylindrical type is usually found in children and the ampullar type in adults.

The position of the rectum with relation to the median line of the body depends upon the construction of the sacrum. When the sacrum is symmetrical the rectum deviates in the direction of the sacral foramen, but when the sacrum is asymmetrical the rectum lies on the opposite side from the displaced sacral foramen.

When the inclination of the aponeurosis of Denonvillier is more than 113 degrees the fundus of the bladder is low, but when the inclination is less than

113 degrees the fundus of the bladder will be found high.

The author describes two types of the male urethra. One type is the small urethra with an even curvature and great length of the fixed segment—the shallow-curve urethra. The other is the urethra with a curvature very pronounced, situated chiefly in the bulb, and a shorter fixed segment—the sharply bent urethra. The curvature of the urethra becomes greater with filling of the rectum and less with filling of the bladder.

With regard to the position of the vagina the author has determined that the vaginal angle of inclination corresponds to that of the aponeurosis of Denonvillier. The lower border of the peritoneal sac is subject to various changes. When the angle of inclination of the aponeurosis of Denonvillier is less than 113 degrees it is situated low, but when the angle is greater than 113 degrees it is situated high. The vesico-uterine pouch is wide when the aforementioned angle is greater than 113 degrees. The vesicorectal pouch exhibits the same peculiarities.

The second part of the monograph is devoted to experimental clinical research. Mosskalenko describes the contour of the pelvic reservoir in certain pathologic processes (inguinal hernia, posterior pelvic cellulitis, hypertrophy of the retrorectal fatty tissue, adhesions of the posterior part of the Douglas pouch) and discusses the peculiarities of the distribution of fluids in the true pelvis under certain mechanical, pathologic, and clinical conditions (the influence of the position of the body, the topography of abscesses of the posterior portion of the Douglas pouch, the distribution of the fluid in ascites, cysts of the posterior portion of the pouch of Douglas, ovarian tumor, and the distribution of the fluids following certain operations on the pelvic organs such as extirpation of the uterus or bladder).

Attention is given also to the drainage of the true pelvis from the standpoint of surgery and gynecology. Mosskalenko distinguishes: (1) perineal, and (2) sacral drainage. For perineal drainage a slanting position of the body is best, Fowler's position or the semi-sitting position of Federoff. Fowler's position is of value, however, only when the pelvic topography is of the symphysopetal type, while Federoff's position gives equally good results in both the symphysopetal and the sacropetal types. Of all types of perineal drainage the rectal is best for males and the vaginal for females. Of all methods of sacral drainage the coccygeal method of Wrenden is most efficient. Technically, rectal and vaginal drainage are the simplest, but the coccygeal method has a better mechanical effect. In the absence of clinical indications regarding the method of draining the true pelvis the choice must be based upon the anatomy. In the symphysopetal type of pelvic topography the rectal or vaginal method must be employed; in the sacropetal type, the coccygeal.

The monograph contains several case histories illustrating the author's points, 292 illustrations, and protocols of the experiments. WALKER (Z).

SURGERY OF THE HEAD AND NECK

HEAD

Wilensky, A. O.: *The Neurological Manifestations of Fracture of the Skull (Cranio-cerebral Injuries)*. *Surg. Clin. N. Am.*, 1921, i, 1709.

A simple fracture of the skull is a relatively benign lesion, but when associated with trauma to the underlying brain it becomes more serious.

The extent of a head injury may vary within wide limits. There are cases in which the wound is of comparatively small size and others in which the entire skull is cracked like an eggshell. With bony injuries of such varied nature and extent the associated intracranial injury may show a similar diversification; the injury may be limited to a single cranial nerve, to a venous sinus, or to a localized and comparatively small area of contused brain tissue, while in other cases the entire brain may be disorganized more or less completely. The latter type of injury is immediately fatal.

The lesions in the brain may consist of numerous small contusions localized in a single area or widespread throughout the major portion of the brain. In more extensive lesions there are one or more lacerations in the brain tissue in addition. In others the surface of the brain cortex loses its normal morphology and is replaced by a mass of grumous, blood-stained, semisolid material resulting from the complete disorganization of the normal structure. In extreme cases the entire brain is involved.

Perceptible lesions in the brain may be produced by pressure from without, either by a depressed fragment of bone or the pressure of a large blood clot. As a rule the accumulated blood clot gathers over the surface of the brain either between the dura and the bone (subdural) or directly over the cortex (subarachnoid). In other cases it is situated in the midst of the brain tissue, either at the bottom of a deep laceration or independent of the latter.

A less common cause of neurological disturbance is interference with the blood supply of some portion of the brain either by pressure upon an important blood channel, especially the longitudinal sinus, or by thrombosis, or both.

It is not necessarily true that the subjacent brain injury will lie in anatomical relationship to the area of fracture.

In about 40 per cent of persons with head injuries sustained in civil life no abnormal neurological findings are noted. Cases with no neurological symptoms at the time of examination may be divided into two groups: (1) the very mild cases, those with scalp contusions and lacerations in which fracture of the skull is not suspected, but is subsequently demonstrated by X-ray examination (these make up the largest number), and (2) cases with such quickly disappearing symptoms that by the time the patient reaches the hospital (usually within an hour) the signs of neurological disturbance no longer persist.

The symptoms produced by brain injuries associated with skull fracture may be classified into two groups. One group is composed of general symptoms related to the brain as a whole and not referable to any one area that can be differentiated. This group has two subgroups. In the first subgroup the general symptoms reflect a general or diffuse interruption of brain function, are associated with the primary general contusion and initial hyperstimulation of brain substance, and are related particularly to the primary unspecialized functions of the brain. In the second subgroup there is a general and progressively increasing intracranial compression. The second large group of cases in which neurological disturbances are present are those in which the signs indicate that only a localized area of brain or nerve tissue is involved.

The typical signs of progressive intracranial compression following an injury include: (1) progressively increasing stupor; (2) progressive slowing of the pulse and respiration; (3) a rise of the blood pressure followed by a fall; (4) swelling of the optic nerve heads; (5) contraction of the pupils which is followed in the later stages by dilation and (6) Cheyne-Stokes breathing. Other neurologic symptoms and signs may coexist. The danger signs include: (1) very slow pulse and respiration; (2) low blood pressure, and (3) dilated pupils. These are the signs which indicate medullary involvement.

It is very important to be able to recognize cases of compression which are due to oedema alone inasmuch as in these operation is not suitable or is of no avail and may possibly do harm. When intracranial compression is due to oedema, spontaneous recovery may result.

Symptoms indicating injury of an area of brain or nerve tissue that can be differentiated—that is, focal symptoms—may be referable to any part of the body; they are present in from 20 to 25 per cent of the cases.

Among the cranial nerves the facial and auditory are most often the site of disturbance after cranio-cerebral injuries, and complete recovery does not always follow.

Focal signs referable to the extremities are most common. In general they may be grouped as those characterized by paralysis and those which are signs of cortical irritation. It must be borne in mind that frequently symptoms of the latter nature which are present immediately after an injury are due to the stimulation of the initial violence and are only temporary phenomena. One should wait a sufficiently long time to make sure that they are established symptoms before accepting them.

Focal symptoms indicating irritation need not necessarily be limited to any one extremity. Focal symptoms of a paralytic nature are classified as regards the number of extremities involved as monoplegias, diplegias, and hemiplegias. In the majority

of cases paralytic symptoms are due to some form of pressure upon the cortex.

A group of cases with longitudinal sinus injury has been distinguished by Holmes and Sargent. These exhibit characteristic symptoms constituting what is called the "longitudinal sinus syndrome." The pathology includes compression or laceration of the longitudinal sinus or some of its anastomotic branches in the neighborhood of the motor cortex which often is associated with injuries in the paracentral lobules or in the convolutions bordering the fissure of Rolando; thrombosis of the sinus is frequently found.

The proper course of treatment for craniocerebral injuries should be determined on the basis of the average results obtained with the conservative and operative forms of treatment. Wilensky has found that the mortality of conservative treatment averages approximately 27 per cent. He summarizes his ideas regarding treatment as follows:

1. Conservative and expectant methods of treatment under proper conditions yield the best results.
2. Operation is imperative in every case of advancing intracranial pressure and should be done in the early stages before there is evidence of medullary involvement.
3. Irritation or paralytic focal symptoms pointing to pressure upon or disorganization of definite cortical areas are the next most important indications for operative intervention. In cases of this type operation is very seldom as urgent as in cases of the second group.

In the author's experience lumbar puncture has not given complete satisfaction as a therapeutic measure. In mild cases of intracranial compression the release of cerebrospinal fluid has been followed by symptomatic relief of slight or moderate degree, but in other similar cases the ultimate result has not differed from that obtained when no such procedure was used.

MARGARET I. MALONEY.

Basilio, M.: Decompressive Craniectomy by Parla-vecchio's Method (Craniectomie decompressive col metodo del Parlavecchio). *Polislin.*, Roma, 1921, xxviii, sez. chir., 515.

The author states that prevailing surgical opinion favors opening of the dura in a one-stage decompressive craniectomy.

Parlavecchio has operated upon numerous cases of essential epilepsy by his method of decompressive trephination. In one case in which he did not open the dura the operation was without benefit. In the other cases in which the dura was opened the convulsive crises disappeared or became less severe.

Basilio believes there is some objection to most of the methods of decompressive craniectomy in present use. Lannelongue's method does not open the dura; Kocher's favors cerebral hernia; Stop-pato's method will be unsuccessful unless the super-imposed bone disc becomes consolidated with the external table. Parlavecchio's operation, he believes, is preferable to any other. In this procedure

a horseshoe incision is made in the temporoparietal region with its base downward. The flap is cut deep, freed from the bone, and turned down. An opening 2 or 3 cm. square is then made in the cranium with the electric saw, directed by Parla-vecchio's special saw guide, the craniectomy is completed by a few strokes of the scalpel, and the bone is removed. Hæmostasis of the diploe is obtained by the usual methods. With the bistoury, crossed incisions are made in the dura to divide it into four triangular strips, each of which has as its base one of the sides of the square made by the craniectomy. These strips are turned over to the outside and sutured to the neighboring pericranium. The external flap is then replaced and sutured, only a strip of gauze being left for drainage. The gauze is removed the second day.

This method forms a permanent decompressive valve. The portion of bone removed need not measure more than 3 by 3 cm.

W. A. BRENNAN.

Anwyl-Davies, T.: Tumor of the Right Petrous Bone. *Lancet*, 1921, cci, 1323.

The patient whose case is reported was a man, aged 47 years, who had been losing weight and becoming deaf for one year. Ten months previous to examination he noted a small lump in the right side of the neck near the angle of the jaw. Pain soon developed and gradually extended up the neck and over the right side of the scalp and forehead. About a month previously he developed diplopia, which was soon followed by drooping of the right eyelid. He noticed also anæsthesia of the right side of the face and began to have severe headaches and insomnia.

Examination revealed complete paralysis of the third, fifth, and sixth cranial nerves and partial paralysis of the first, fourth, eighth, ninth, tenth, and eleventh nerves. A hard gland the size of an egg was found between the angle of the jaw and the anterior border of the sternocleidomastoid on the right side, and a chain of hard small glands along the anterior border of the right trapezius.

There were three possible locations in which a lesion could cause such widespread involvement: the medulla near the nucleus of the fifth nerve, the cerebellopontine angle, and the petrous portion of the temporal bone. That a medullary growth was not responsible was indicated by the absence of interference with the centers controlling the heart, respiration, temperature, and sugar metabolism. The absence of a lesion of the cerebellopontine angle was indicated by the absence of severe headache, vomiting, optic neuritis, and symptoms of cerebellar pressure, such as nystagmus, ataxia, weakness, and vertigo.

It is pointed out that a growth, at most 1 in. in length, which extends backward from the apex of the petrous bone, may affect all the cranial nerves except the second and twelfth. In this case only the second, seventh, and twelfth nerves had escaped. The immunity of the seventh was due probably to

its superior powers of resistance and the fact that it lies on the eighth nerve and is separated by it from the bone.

Several possibilities as to the nature of the disease were considered, viz., sarcoma, carcinoma, gumma, tuberculosis, enchondroma, a fibroid growth, and a hydatid cyst. The glands of the neck seemed to indicate malignancy, particularly carcinoma because of the relatively slow rate of growth. The treatment could be only palliative and the prognosis was extremely poor.

H. E. BOZER, M. D.

Gamberini, C.: The Treatment of Traumatic Epilepsy (Trattamento dell'epilessia traumatica). *Riforma med.*, 1921, xxxvii, 1170.

The author has been able to collect seventy-one cases of cranial injury treated by operation. Epilepsy developed in forty-four (61.97 per cent). In thirty-four it developed immediately or soon after the injury, and in ten, two or three years later. In six of the cases of epilepsy the injury occurred in the frontal region (dura intact in one; cerebral lesions in five); in thirty-four it occurred in the central cranial region (dura intact in six; cerebral lesions in eighteen); and in four it occurred in the occipital region.

In six cases of wounds with a cranial breach the epilepsy was treated by simple denudation without cranioplasty. This caused improvement, recovery, and late disappearance of the epilepsy in three cases respectively but failed in two cases.

In three cases the cranial defect was repaired. In one case there was no improvement, but in the two others recovery resulted.

Treatment by excision of the wound in the first stage and a cranioplasty performed from a few months to two years later in seventeen cases resulted in recovery in eight, improvement in four, and failure in two. In three, the epilepsy recurred late.

The total number of cases of epilepsy operated upon was thirty-three. Of these, fifteen were cured, five benefited, and thirteen not benefited. Twenty-seven of the operations were cranioplasties; fourteen resulted in a cure, five caused improvement, and eight had no effect.

Sixteen cases of cranial lesions with nervous disturbances not true manifestations of epilepsy were treated by cranioplasty. Two were not benefited, but in the fourteen others there was improvement or disappearance of the condition. Of eight cases not treated by cranioplasty, the condition remained unchanged in six and became improved in two.

There were twelve cases of generalized epilepsy, twenty-five cases of Jacksonian epilepsy, and seven cases with nervous phenomena resembling those of epilepsy.

In every case of cranioplasty except one the author has used autoplasmic grafts. He draws the following conclusions:

1. In cases of traumatic, Jacksonian, and general epilepsy removal of the recognized or presumed

cause (the cutaneous, meningeal, or cerebral scar, foreign bodies, etc.) is definitely indicated to combat the epileptic seizures.

2. In these cases cranioplasty is also necessary. Even in the absence of recognized anatomical causes for the crises, the cranial decompression has a direct value as it often cures the epileptic disturbances.

3. The best results in the repair of extensive defects of the cranial vault are obtained by the method of autoplasty in which a reversed osteo-periosteal strip is used.

W. A. BRENNAN.

Hagemann, J. A.: An Unusual Instance of a Foreign Body Penetrating the Head. *J. Am. M. Ass.*, 1921, lxxvii, 2053.

The author reports the case of an Italian who was stabbed in the left temple. The weapon, a flat file ground to a keen edge on one side and to a sharp point at the end, entered the left side of the head about 3.8 cm. behind the external canthus and about 1.3 cm. above the zygomatic process of the malar bone. The point pierced the temporal muscle and the great wing of the sphenoid bone, traversed the floor of the orbit, penetrated successively the left ethmoid bone, the nasal septum, and the right ethmoid bone, and projected about 19 mm. into the postero-superior portion of the right maxillary sinus. At a point on the floor of the left orbit the blade broke and the section nearer the handle was extracted or fell out. The presence of the pointed end of the dagger was not suspected until it was revealed by the roentgenogram. This piece was successfully removed at operation by approaching it from below through the antrum.

FREDERICK CHRISTOPHER, M.D.

Goljanizki, I. A.: Cases of Extraction of Foreign Bodies (Projectiles) from the Brain (Faelle von Extraktion von Fremdkörpern (Projektile) aus dem Gehirn). *Sitzungsber. d. Saratower chir. Ges.*, 1920.

Following a short review of the literature the author reports three cases of extraction of projectiles from the brain. In the first case a shrapnel wound had been sustained eleven months previously. Immediately after the injury there were no symptoms, but subsequently the patient experienced pain in the left side of the head during motion and agitation, and especially on bending down. No objective changes in the nervous system were apparent. The cicatricial wound of entrance of the shot in the upper region of the forehead to the left of the midline showed a slight depression of the bone. By means of roentgenograms taken in two directions, the foreign body was located in the occipital region, 2 cm. to the left of the midline, at a depth of 1 cm. from the lamina vitrea, and on a horizontal plane with the external occipital protuberance and the middle of the left zygomatic arch. After osteoplastic exposure of the occipital region and palpation of the shrapnel ball in the brain just over the tentorium, the ball was extracted

through a small incision. The postoperative course was smooth, and the patient recovered.

The complaint in the second case was headache. There were no other nervous symptoms. The X-ray showed a bullet in the left occipital region just over the transverse sinus, 4 cm. from the midline and $\frac{1}{2}$ cm. from the bone. After osteoplastic exposure the bullet was felt by the finger just under the brain surface and extracted through a small incision. The patient was discharged well.

The third case was that of a man who was shot in the right eye three and one-half months previously. At first there was a left hemiplegia but later this disappeared almost entirely. The patient complained only of slight weakness on the left side, but urged the removal of the bullet. On roentgenological examination the bullet was found in the middle cranial fossa at the upper border of the right pyramid. An osteoplastic trephination was done over the right temporoparietal region, the flap was reflected with a blunt hook, and a finger pushed along the anterior surface of the pyramid. The bullet was indistinctly felt almost at the tip of the pyramid deep in the brain substance, about 2 cm. from the surface. By dull dissection, the tip of the finger was inserted into the brain substance and the bullet extracted. Six days after the operation the patient was unconscious, and on the seventh day flaccid paralysis of the right extremities developed. After one and one-half months, however, he was discharged with only slight weakness of the affected extremities.

On the basis of his observations, especially the last case, the author draws the following conclusions:

1. Even in the absence of all symptoms, the presence of a foreign body in the brain, the danger of infection, and the patient's request are sufficient indications for trephination.

2. The value of any method of localizing a foreign body is only relative as even when the position of such a body is known exactly, it may be necessary to approach it by a very indirect route if injury to important structures (ventricles and vessels) is to be avoided.

3. The best and most generally used aid in locating a foreign body is the roentgenogram taken in two directions.

4. Superficial and deep palpation of the brain with the finger is one of the most delicate methods of searching for foreign bodies in the brain.

RIESENKAMPFF (Z).

Gamble, H. A.: The Treatment of Brain Injuries.
Internat. J. Surg., 1921, xxxiv, 429.

After remarks on the pathologico-physiological changes induced by trauma to the brain, the author classifies cranial injuries into three groups: (1) those due to concussion, (2) those due to compression, and (3) those due to contusion.

Clinically the orderly sequence of symptoms usually described as characteristic of increased intracranial pressure is not always present. Marked man-

ifestations of cortical excitation may be present in an advanced and serious condition. There may be focal paralysis even with a high degree of intracranial pressure.

The most certain diagnostic symptoms of increased intracranial pressure are: (1) an increase in the spinal fluid pressure; (2) a progressive rise in the blood pressure; (3) a progressive slowing of the pulse. Other conditions indicating cranial injury are focal symptoms, the eye-ground appearance, bleeding or loss of cerebrospinal fluid from the ears or nose, orbital hæmorrhage, and the local appearance of the area of trauma.

The author warns against delaying operation when the three symptoms previously mentioned are present, and reports the histories of two cases in which death was due to such delay. Operation should not be performed during profound shock or delayed until a falling blood pressure, rapid pulse, and Cheyne-Stokes respiration indicate approaching death.

Operation is indicated in cranial injuries for the relief of pressure, the control of hæmorrhage, the removal of foreign bodies, and the prevention of infection. The operative site is determined by the local wound or focal symptoms. If both are absent, a subtemporal decompression is best to find the hæmorrhage and to drain the middle fossa.

Very important points in the operative technique are the wide opening of the dura for its decompressive effect after evacuation of the clot and elevation of the bone and, in cases of extensive trauma, the establishment of drainage. In the author's opinion removal of the bone flap is not necessary to obtain decompression of the opened dura.

Compound fractures of the skull should be operated upon as soon as the patient's condition will permit. When there is marked damage to the brain tissue the wound must be left open to provide the freest possible drainage.

The author quotes Cushing's description of débridement of war cranial injuries.

Gamble prefers local anæsthesia preceded by morphine and scopolamine if the patient is not already in a stupor.

The mortality of 50 to 60 per cent can be reduced by earlier recognition of the symptoms and improved technique.

The author reports forty cases. In the twenty-six operated upon there were seven deaths, a mortality of 26.9 per cent. Two patients died from meningitis, three from paralysis of bulbar centers due to delay of operation, one from brain abscess, and one from extensive destruction of brain tissue. Of the fourteen patients not operated upon, eight had symptoms of concussion, possibly of contusion, but had no symptoms of increased intracranial pressure; three had a fracture of the base without pressure symptoms; two died from extensive brain injury; and one died with symptoms of compression in the cerebellar region.

The most frequent complications, aside from the loss of function of the damaged brain tissue, are meningitis, brain abscess, and cerebral hernia.

WALTER C. BURKET, M. D.

Izquierdo, M.: A Case of Atypical Cerebral Localization (Un caso de atipia de localización cerebral). *Rev. méd. de Sevilla*, 1921, xl, 18.

The case reported was that of a man, 49 years of age, who had facial and ocular motor paralysis and trigeminal neuralgia. A peripheral lesion was suspected as the symptoms of a central lesion would have been more complex. The lesion was believed to involve the aqueduct of Sylvius and the fourth ventricle. As the patient's history suggested syphilis, he was placed on specific treatment. Death occurred suddenly from cerebral hæmorrhage several days later.

The autopsy disclosed a large hæmorrhagic focus in the aqueduct of Sylvius on the right side. The meninges of the brain were held by temporal and parietal adhesions, and the cerebral substance of the temporal lobe was softened.

While the ocular motor paralysis is easily explained by the softening of the temporal lobe and the meningitis, no explanation could be found for the absence of symptoms attributable to the destruction of the temporal and parietal lobes. According to modern theories, the speech center in the left hemisphere is situated only in the zone of Wernicke and lesions of this zone should give rise to aphasia (Wernicke's aphasia). The author agrees with Marie that there must be a center of localization in both cerebral hemispheres, and that a double lesion or some inhibitory action must be necessary for loss of function.

W. A. BRENNAN.

Spaar, E. C.: A Case of Bilateral Cerebellar Abscess with No Localizing Symptoms. *Indian M. Gaz.*, 1921, lvi, 451.

The patient was a Singhalese girl, 8 years of age, who was admitted to the hospital January 17, 1921 in a semi-conscious condition with a history of fever of six days' duration and inability to speak. The child had been in perfect health until two months previous to admission, at which time she had a fall. That night she was inclined to be quiet and complained of vague pains all over the body, but more marked along the spine and in the neck. She slept during the entire next day, though she complained of no discomfort. Under native treatment she was restored to her usual health in ten days.

A month later certain peculiarities in disposition became noticeable. She was easily irritated, cried for no apparent reason, showed a great aversion to sweets, for which she usually had a great liking, was not particular about taking her meals, became fond of visiting dark places, would sometimes lie down gazing at the roof, and shunned her friends. During the six days prior to her admission to the hospital she had fever in the evening; no definite information could be obtained as to any rise in the morning.

During this period she was extremely irritable, shunned bright objects, closed her eyes, doubled her body, supported her head with her hands, and cried frequently that her head was being crushed. She complained also of a bitter taste in her mouth. There was no chill, rigor, or fit before or during the attack of fever. When the temperature dropped in the morning she moved about comfortably, though with the spine and neck held rigid. On the morning of her admission to the hospital she rose from bed at about 5 o'clock and kept looking at the roof. Suddenly she called out, held her head with her hands, vomited once, and fell unconscious. Her body was held rigid and doubled up and her neck was retracted and stiff.

On examination the patient was unconscious with the head retracted, the eyes partially closed, and the extremities cold. The pupils were dilated and there was a tendency to conjugate deviation of the eyes to the right with slow nystagmoid movements and external strabismus. The knee jerks were exaggerated and ankle clonus and the Babinski sign were present. The femoral glands were tender but not enlarged. Rales were heard over the bases of both lungs. The heart was normal.

A diagnosis of tuberculous meningitis was made. By lumbar puncture 25 c.cm. of slightly turbid fluid were removed. This contained a trace of albumin and a few lymphocytes and polymorphonuclears.

The patient died January 21. Postmortem examination showed tuberculous abscesses in both the lobes of the cerebellum. One was extensive, occupying the greater part of the left lobe. Miliary tubercles were found about both sylvian fissures and in the left temporosphenoidal lobe. The lateral ventricles were much dilated and filled with cerebrospinal fluid.

The remarkable feature of this case was the absence of symptoms indicating cerebellar abscess. The decubitus in the early stage of the illness was characteristic of tuberculous meningitis—Stocker's sign. Instead of paresis of the limbs there was rigidity. The paralysis of the sixth cranial nerve was a sign common to tuberculous meningitis as well. Even the nystagmus, which might have been such a valuable sign in the diagnosis of cerebellar abscess, lost its significance because of its temporary duration, the presence of the meningitis, and the loss of consciousness which rendered more definite testing impossible. Other interesting features were:

1. The very trifling prodromal symptoms during the period of the tuberculous invasion of the meninges, although the presence of several classical symptoms in the latter part of the period might have suggested the nature of the illness to a careful observer.

2. The very abrupt onset of the terminal stage of the disease with vomiting and sudden loss of consciousness.

3. The temperature, which steadily rose from the time of the patient's admission to hospital until her death.

4. The probable absence of a primary focus for the tuberculous meningitis. The bronchial and mediastinal glands and the lungs were normal. The middle ears were not examined, but there was nothing to suggest middle-ear disease.

MARGARET I. MALONEY.

Linck: The Clinical Aspects and Pathology of Brain Abscesses (Beitrag zur Klinik und Pathologie der Hirnabscesse). *Deutsche Ztschr. f. Chir.*, 1921, clxvi, 65.

Linck reports three cases of otitic abscess and one case of traumatic abscess of the brain, in two of which death occurred after operation.

In cases of depression fractures with shattering of the brain and opening of the cranial cavity it is easy to determine the cause of the abscess, but otitic sources are more difficult to discover. In the latter type of case consideration must be taken of: (1) extension of the infection by continuity; (2) the development of the abscess as a metastasis through the blood or lymph stream; and (3) indirect metastasis through the general circulation. As a rule the infection is spread by way of the second route, being conveyed by the pia and mastoid veins. The fact that our knowledge regarding the relationship of the vascular system of the endocranium with the base of the skull is still very imperfect adds to the difficulty in coming to any conclusion. A true abscess membrane is not necessarily a sign that the process has limited itself. Rupture of this membrane may occur at any time and lead to diffuse encephalitis.

An abscess that lies in a so-called silent region is the most difficult to diagnose. While its presence may be recognized, it is impossible to determine its location. The examination of the spinal fluid is of importance for it is certain that a lymph stream runs from the neighborhood of the abscess to the ventricle, and from the presence of pathologic constituents in the fluid one may draw conclusions as to whether the abscess is limited by a membrane or surrounded by a zone of encephalitis. From the presence of a choked disk conclusions may be drawn as to the site of the lesion.

The treatment presents the following problems: (1) the removal of the original focus; (2) the discovery and removal of the abscess cavity; (3) the emptying and care of the abscess cavity. In the search for the abscess a syringe with a thick needle is used. The author has discarded the usual method in which the abscess is opened with the scalpel, dressing forceps are introduced and their blades spread, and a drain is inserted blindly. He proceeds with greater care. Close to the puncturing needle he tears the dura, advances a Lucae bayonet forceps along the cannula, introduces a Voltolini speculum, and by the aid of a head-light cleanses the abscess cavity by gentle swabbing. He then seeks all the inlets of the affected area and, guided by the eye, loosely tampons all crevices. The tampon is changed every two or three days and the tamponade by

speculum is continued until the cavity is lined with healthy granulations and reduced in size. This method is useless and impossible when marked oedema and progressive encephalitis are present.

FISCHER (Z).

Neuhof, H.: Giant Endothelioma of the Medulla: Suboccipital Craniotomy and Removal of the Arches of the Atlas and Axis under Local Anaesthesia. *Surg. Clin. N. Am.*, 1921, i, 1693.

The case reported was that of a woman, 38 years old, who had persistent occipital headache, progressing paralysis of the extremities, bladder disturbance, and dyspnoea.

Physical findings of importance were atrophies and paralysis of all four extremities, more marked on the right side; absence of the superficial reflexes; marked reduction of the deep reflexes; a decrease or loss of sensation over the entire body except the face and anterior half of the scalp; limitation of motion of the head with wasting of some of the neck muscles; lateral nystagmus; paralysis and fibrillary twitchings of the right half of the tongue; and diaphragmatic respiration. The diagnosis of medullary tumors is difficult. The diagnostic points in this case were the headache, loss of sensation, quadriplegia, and the presence of a rounded prominence in the region of the second and third cervical vertebræ which could be felt through the pharynx.

The X-ray is apt to be deceiving because if it shows arthritis or exostoses it may lead to the conclusion that these are the cause of the symptoms noted.

In the case reported operation was undertaken to relieve the impending respiratory failure which contra-indicated general anaesthesia. Novocaine was used.

The patient was placed in the prone position with the shoulders up to the end of the table and her head supported in the lap of an assistant. A cross-bow incision was made as for a suboccipital craniotomy. The lower part of the occipital bone, the posterior three-fourths of the rim of the foramen magnum, and the arches of the atlas and axis were removed. The bleeding is less profuse under local than under general anaesthesia.

When the dura was incised, considerable spinal fluid under high pressure escaped but the patient's condition remained unchanged. A firm, rounded, reddish-gray tumor was then found occupying most of the spinal canal and crowding the medulla and upper cord far over to the left. The major part of the tumor extended in front of the medulla and upward under the cerebellar lobes and could not be removed without further damage to the medulla. The medulla and cord were compressed to less than half the normal diameter. Bleeding from the cut surface of the tumor was controlled by pressure. A radium needle was hooked into the growth, to be removed later by means of the attached thread. The dural incision was left open and the wound closed by layers.

There was no postoperative shock, but respiration ceased after thirty-six hours and the pulse ten minutes later.

At the postmortem examination the tumor was found to measure 3 by 4 by 5 cm. and to be attached to the dura anterior to the medulla. Pathologic examination showed it to be an endothelioma.

MARCUS H. HOBART, M.D.

Dandy, W. E.: The Treatment of Brain Tumors.
J. Am. M. Ass., 1921, lxxvii, 1853.

The points in this article may be summarized as follows:

1. Brain tumors are among the most frequent neoplastic lesions: their growth is always progressive and usually leads to grave sequelæ and eventually to death.
2. There is only one form of treatment for tumors of the brain, i.e., operative removal, and this must be complete.
3. To obtain the best operative results, brain tumors must be diagnosed and localized in their earliest stages.
4. It is now possible to diagnose and localize practically every tumor in its early stages. When all other signs and symptoms fail, cerebral pneumography will make the diagnosis and localization accurately and definitely, and when a tumor is not present will exclude the condition.
5. The operative approach will be dictated by the precise localization. The approach should afford adequate room, and should be directly over the tumor.
6. After correct localization, all brain tumors should be disclosed at operation.
7. Every effort should be made to effect a cure by complete extirpation of the growth. The mortality of carefully performed extirpations is lower than that of unsuccessful explorations. When it is impossible or unjustifiable to remove the tumor, the maximum palliative relief should be given at the same operation.
8. Decompressions, routinely performed, are among the most harmful and indefensible operations in surgery. They should never be performed for unlocalizable tumors. In such cases they are equal to the administration of morphine for abdominal pain as they mask the symptoms until it is too late.
9. Decompressions should be performed only as a last resort, i.e., when the tumor cannot be removed, and then should be done only after the location of the tumor is known. In half of the cases of brain tumor no good can possibly be derived from a decompression.
10. Exploratory craniotomy for brain tumor is scarcely ever indicated. The tumor should be accurately localized before operation is attempted.
11. Scientific accuracy must supplant guesswork in the diagnosis and treatment. The treatment can be only the direct, prompt, and efficient eradication of the cause.

FREDERICK CHRISTOPHER, M. D.

Magnus, V.: The Clinical Aspects and Results of Brain Surgery (Beitraege zur Klinik der Hirnchirurgie und Resultate). *Norsk Mag. f. Lægevidensk.*, 1921, lxxxii, 3.

This article is based on cases in the author's private practice. From 1903 to 1920 there were 195 operations for cerebral tumor in 112 cases. Sixteen of the patients died, a mortality of 8.1 per cent; twelve patients were cured and forty-eight were relieved of severe pain and retained their power of vision for the rest of their lives, from one-half to five years.

Of twenty patients operated on for epilepsy, one died, two were cured, and two were benefited. The condition of the rest remained unaltered. Two cases of secondary traumatic subdural hæmorrhage and two cases of traumatic meningitis serosa were cured. One case of traumatic hemiplegia and two cases in which a palliative trephination for cephalalgia was done remained entirely unaltered. One case of cephalalgia associated with scaphocephalus and one case of cephalalgia associated with achondroplasia were cured. In thirty-one cases of trigeminal neuralgia treated by extraction of the pontine root or resection of the gasserian ganglion there were thirty cures and no deaths. Magnus gives the histories of the 112 cases of cerebral tumor. He draws the following conclusions:

1. Palliative trephination should be done as soon as a diagnosis of brain tumor and choked disk is made and there are no definite focal signs or symptoms of metastasis. The earlier trephination is performed the better the chances of preserving sight. The dura mater should always be opened to the greatest possible extent.
2. In typical cases of Jacksonian epilepsy an exploratory craniectomy should be undertaken even in the absence of choked disk.
3. Operation should be performed as soon as possible when epileptic convulsions increase in frequency, when paralysis is progressive, when the patient complains of dimness of vision, and when, on the whole, there are signs of increased brain pressure.
4. In cases of deep tumors only craniectomy with the formation of a large trephination opening, removal of the bone, and wide opening of the dura should be undertaken.
5. When the dura is found to be tense the lateral ventricle should be punctured before the dura is opened.
6. In traumatic epilepsy trephination and opening of the dura are indicated.
7. In cases of continuous headache following injury to the head ophthalmic examinations should be made at intervals of a week. If choked disk is found, palliative trephination is indicated.
8. Peripheral operations for trigeminal neuralgia are useless. Injections of alcohol are far more effective. If these no longer give relief, the pontine root of the gasserian ganglion should be removed.

KORITZINSKY (Z).

Moure, P.: Facial Autoplasty by Means of Scalp Flaps with Long Pedicles from the Temporal Region (*Les autoplasties faciales par lambeaux de cuir chevelu à longs pédicules temporaux*). *Presse méd.*, Par., 1921, xxix, 1021.

The use of the scalp to repair losses of substance in the face is of relatively recent date. The author has made several facial restorations by this method and has obtained excellent results.

The scalp furnishes richly vascularized flaps and, in addition, hairy grafts with which the moustache and beard can be replaced. The method described is applicable to lesions of such extent that the use of tissue from the immediate vicinity is impossible. It can be employed to restore the upper and lower lips, the chin, and the cheek, and especially the buccal commissura. The scalp graft may be cut so as to leave a temporal pedicle containing the temporal artery; this arterial irrigation assures remarkable vitality. The flap is cut long from one temple to the other, swung around on its pedicle, and brought down to the spot where it is to be applied. Following its fixation to the freshened edges of the defect it rapidly forms vascular connections. It is not separated from its pedicle for from fifteen to twenty days. During this period the cranial surface from which it was removed must be kept covered with compresses soaked with sterile oil. There is not a centimeter of loss because any part of the strip not used to replace the loss of substance may be replaced on the cranium. The scars resulting from sutures are rapidly hidden by the growth of hair.

Several cases operated upon in this manner are described and illustrated. In the first case a very large cheek defect was successfully covered and fifteen months later the graft had acquired perfect suppleness. In the second case the graft was used to replace the moustache. When the scalp strip is first sectioned from the pedicle any hair on it usually falls out but grows again later on. Some re-touch operations may be necessary.

The author is satisfied that the use of long-pediced scalp grafts is of great value for the repair of facial defects. In the cases of women the temporal pedicle may be replaced by an occipital pedicle and the graft taken from the shoulder region.

W. A. BRENNAN.

Gibson, A.: Facial Paralysis. *Surg., Gynec. & Obst.*, 1921, xxxiii, 472.

Facial paralysis is a serious disability because of psychic and physical complications. Its gravity, prognosis, and treatment depend upon its cause and site. A study of the sensory characteristics of the facial nerve has been made by Hunt.

Paralysis results from interference at any point between the lowest motor cortex of the facial musculature and the ultimate distribution of the fibers. A lesion at any point between the nucleus and the point of exit from the pons may cause disturbance of the sixth nerve or a crossed paralysis. A lesion

between the pons and the fallopian aqueduct causes involvement of the eighth nerve or hyperacusis due to paralysis of fibers to the stapedius muscle. A lesion in the aqueduct causes disturbance of the chorda tympani. Following separation of the chorda tympani there is complete motor paralysis (Bell's palsy) without disturbance of taste or hyperacusis.

Causes of supranuclear paralysis are brain tumor, abscess, and cerebral hemorrhage. Nuclear paralysis suggests syphilis. Diphtheria and poliomyelitis may be associated with paralysis. Infranuclear paralysis may have its origin in a tumor or hemorrhage in the pons, or a tumor of the cerebellar pontine angle, but the three most common causes are simple neuritis from exposure to cold, acute or chronic otitis media, and trauma (especially that of the mastoid operation). Bilateral paralysis is uncommon and of uncertain origin.

Cases of simple neuritis due to exposure or Bell's palsy and cases of localized oedema from a reactive process following operation usually clear up. When numerous branches arise near the point of damage the outlook is not so favorable. Upper neurone cases and sudden complete paralysis following a mastoid operation which do not clear up in six weeks are not apt to recover spontaneously. The presence of a faradic response is always a hopeful sign. After complete nerve severance the reaction of degeneration appears in two weeks. Quantitative measurement of electrical response is of more prognostic value than qualitative response.

When facial paralysis is secondary to brain tumor, cerebral hemorrhage, or hemiplegia, attention to the primary condition is essential. Cases of Bell's palsy or of spontaneous recovery are treated only by facial muscle massage and galvanism (although of doubtful value). Permanently complete paralysis demands surgical care. Operative procedures attempt either to remedy the main disadvantages from defective musculature by plastic muscle and fascia transplantation or to innervate the muscles by nerve anastomosis.

Plastic operations are advisable when nerve anastomosis has definitely failed or only one nerve branch has been injured, and are performed to elevate either the eyelid or the angle of the mouth. Plastic methods of Lexer, Stein, Jianu, and Busch Mombert are mentioned. Muscles elevating the angle of the mouth are most important, those elevating the lower eyelid next in importance, and the group acting upon the forehead and eyebrow least important.

Nerve anastomosis affords more equal muscle innervation and produces a less visible scar. Careful end-to-end anastomosis usually gives at least some recovery of function. Lateral implantation fails clinically. The author reviews the literature on faciospinal accessory and faciohypoglossal anastomosis. Frazier and Spiller recognize three stages of improvement: (1) restoration of normal muscular tone, which is to be expected ordinarily and warrants operation; (2) voluntary control over individ-

ual muscles; (3) complete recovery, which is more probable in young persons.

The author describes operative procedures for fasciohypoglossal anastomosis. In order not to injure the fibers, the finest non-cutting needles threaded with fine silk—preferably a strand of the finest Chinese twist silk—are used to stitch the sheaths of the nerves together. Even the finest catgut lacks sufficient flexibility and is apt to bruise the nerve. The experimental work of Sargent and Greenfield shows that fine silk is less irritating than plain catgut. No special bed or covering is prepared for the anastomosis. The author gives the records of eight cases.

Gibson states that muscle tonus and voluntary movement will probably return. Emotional movement of the face is usually absent. It is necessary to educate the tongue cortex to perform the complex duties of the facial cortex. After middle life the formation of new paths with new duties is imperfectly accomplished. Under intelligent self-education of the facial muscles, emotional movement may be regained. For this purpose the hypoglossal is preferable because in emotional expression speech is used rather than the sternomastoid and trapezius muscles, tongue movements are finer than shoulder movements, and the proximity of the speech center to the facial cortex may favor association paths. The absence of the sensation of taste is usually unnoticed by the patient. The loss of the motor function of half of the tongue in mastication, swallowing, and speech leads to no material inconvenience and becomes less noticeable. The appearance of the tongue is of no importance. On the other hand, loss of power in the sternomastoid and trapezius muscles produces deformity and discomfort.

WALTER C. BURKET, M. D.

Van Allen, C. M.: Transorbital Puncture of the Gasserian Ganglion. *Ann. Surg.*, 1921, lxxiv, 525.

The contest for supremacy between chemical neurectomy and operative neurectomy has been fought for thirty-five years. Although operative neurectomy is undoubtedly the method of choice at present, a conservative view must concede the possibility that further observations and improvements in the technique may reverse this decision.

Any effort to improve and simplify the technique of the injection of the trigeminus will be valued not only for the help it may afford in the treatment of trigeminal neuralgia, but also because of its obvious usefulness in nerve block anesthesia for the difficult technical operations within the zone of distribution of the fifth nerve. The latter is probably its most fruitful field of usefulness.

A large amount of work has been done in an effort to overcome the uncertainties and eliminate the dangers of ganglion puncture by way of the foramen ovale. Any method of approaching the ganglion through the foramen ovale is lacking in two important respects—there is no natural, easily followed

pathway leading to the foramen and no limiting boundary to indicate the proper depth of penetration.

This article presents a hitherto untried avenue of needle approach to the gasserian ganglion which will satisfy these two primary requirements and at the same time remain within the boundaries of reasonable safety. The approach is the orbit, the path followed is the medial orbital wall, and the portal of entrance to the cranial cavity is the sphenoidal fissure. The needle is guided by the sense of touch along a smooth bony surface until its progress is obstructed by the bony fossa lodging the gasserian ganglion. The needle is separated from the delicate structures of the orbit by the medial rectus muscle, and in the sphenoidal fissure it occupies the lower compartment which contains no nerves or vessels.

Special emphasis is placed upon the fact that Meckel's cave can hold only a few drops of fluid and any excess flows freely backward along the nerve trunk into the subarachnoid cistern at the base of the brain. This occurrence is inevitable when fluid is injected into the gasserian ganglion by any method in greater quantity than 0.5 c.cm. Many instances are on record of ganglion punctures by the techniques of Harris and Haertel in which there were undoubted symptoms of irritation of the structures in the basilar cistern, principally the third, fourth, sixth, seventh, and eighth cranial nerves. This danger offers the one serious objection to alcoholization of the gasserian ganglion.

On the basis of punctures on cadavers, the author concluded that, from an anatomical standpoint, the technique described showed an efficiency of about 90 per cent.

In four out of five clinical cases in which it was tried the method was successful in producing anesthesia of the entire trigeminal field. Whether successful or not, the passage of the needle in these instances inflicted no serious damage. The orbital portion of the route was entirely painless, but the passage behind the orbit was intensely painful.

The striking of cerebrospinal fluid at the end of the passage indicates that the cave of Meckel is reached and that injection of the solution will involve the ganglion root. The striking of blood indicates clearly that the needle has stopped within the cavernous sinus and that all further attempts to reach the ganglion should be abandoned. If the puncture is dry, the needle has entered the lower part of the ganglion below Meckel's cave, and an injection of solution will flow upward into the cave and thereby infiltrate the nerve root, or the needle missed its mark and has come to lodge in some non-vascular tissue.

It is evident that any injury inflicted upon the root of the ganglion by the injection of alcohol will be shared to a less extent by neighboring nerves. This is true whatever approach or technique is used. Transorbital puncture is no exception. Accordingly, until some means is discovered to prevent this widespread diffusion of the alcohol the author is

unable to recommend the puncture for the treatment of trigeminal neuralgia. In the meantime, however, the results of this work, both anatomical and clinical, have led him to believe that trans-orbital puncture of the gasserian ganglion furnishes a relatively simple means of securing block anæsthesia for operations in the territory supplied by the trigeminus which is fully justified when general anæsthesia is contra-indicated.

FREDERICK CHRISTOPHER, M.D.

Monnier, E.: Operations for Cleft Palate (Ueber Gaumenspalten-Operationen). *Schweiz. med. Wchnschr.*, 1921, li, 970.

The author reports the results in ninety cases of cleft palate operated upon by himself. The treatment has a double task: (1) the correction of the malformation, and (2) the realization of the best possible function. Function will be poor if the operation is undertaken too late. Moreover, cleft palates that are not operated upon are a considerable danger; children so affected usually suffer from disturbances of nutrition, diseases of the respiratory tract, and lowered resistance. Therefore early operation is urgent.

In infancy the bones of the face are still easily molded. Later they become more unyielding because of greater calcification. Many surgeons, however, see a contra-indication in the fact that as a rule infants withstand operation poorly. Others are restrained also by the technical difficulties and the belief that the delicate tissues dealt with do not have the necessary resistance. Such considerations are only partially justified. When the infant is given proper care its tolerance is surprisingly great, and if the surgeon has had sufficient experience, the technique of the operation is not very difficult. Good preparation of the patient and the prevention of the aspiration of blood are absolutely essential.

In the author's opinion the best time for operation is the end of the first or the middle of the second year. If harelip and malformation of the jaw are associated conditions their correction must be undertaken very early as the pressure of the sutured borders of the lips has a formative influence upon the superior maxilla. Unfortunately it is not possible to achieve the continuity of the split parts very early by means of a prosthesis as the teeth are still absent.

According to Drachter, three stages of cleft palate are distinguished. The first stage begins at birth and ends at the closure of the harelip. During this period the edges of the cleft are parallel and the uvular flaps are turned toward each other. The second stage is that of the most favorable width of the cleft. The cleft is triangular, its edges are still parallel in the region of the soft palate, and the uvular flaps are turned toward each other. If the cleft is left to itself, the third stage sets in. In this the separation always increases and the uvular flaps diverge. The most favorable time for operative closure is the second stage, which lasts approximate-

ly from the first to the third year of life. At any rate, the closure should be done before the time of physiological speech.

The author's cases were operated on according to the Langenbeck-Baiseau method exclusively, which produced a very good result even when the cleft was very wide. When primary union appeared uncertain the operation was done in two stages. In Monnier's opinion, the advantage of the two-stage procedure is considerable. In the first stage the flaps are separated as usual. From five to eight days later they are freshened and united by suture. After the first stage, the flaps apply themselves to the support to which they are only slightly adherent and thereby become thicker. Small and accidental necroses of the edges can be easily removed in the second stage. In the second stage the absence of disturbing hæmorrhage is very advantageous.

Too great mobilization of the mucoperiosteal flaps is done at the expense of the stretched muscular elements. Tenotomy and chiseling off of the pterygoid hamulus should be avoided. Sufficient mobilization is obtained by a slow stretching of the muscle bundle with the tip of the finger. The separation at the posterior edge of the alveolar process should be done most carefully. It is advantageous to extend the incision widely into the mucosa of the cheek so that the posterior palate portions can be well displaced. Prolapse of the corpus adiposum malæ caused thereby is of no consequence. The pedicle of the anterior flap must be formed very carefully even though it plays a minor part in the nutrition of the flaps. A flap that is too narrow may tear secondarily but such a flap does not become necrotic. The cleft edges were freshened only after the complete mobilization of the flaps because this can be done much more exactly when the flaps are freely movable.

The best suture union is the exact knot suture with the finest silk strengthened by two or three protective sutures of thicker silk. The author uses the long-shanked needle holder of Helbing exclusively and a long-necked Hagedorn for the anterior part. First of all the uvula must be very carefully sutured. Usually this requires four or five stitches in the front and three stitches at the back. The uvula heals rapidly and prevents the separation of the anterior suture. The whole suture requires fifteen to twenty knots. Horsehair, recommended by Helbing, is also very useful. In most cases the author applied a sterile linen bandage around the flaps at the end of the operation. He does not believe that this will cause the formation of lateral fistulæ. The rolling-in of the flap edges must be carefully avoided.

All the operations were done under light chloroform anæsthesia induced by means of a catheter inserted in the nares, the head hanging down.

Monnier's cases included fifteen complete clefts with protrusion of the intermaxillary bone, thirty complete clefts with clefts of the alveolar process, thirty-four subtotal clefts, and eleven clefts of the soft palate only. A harelip operation had been done

previously in sixty-five cases. Twenty-two cases were operated upon during the first or second years of life. In the ninety cases there were only three deaths, one due to pneumonia and another to thrombosis of the transverse sinus resulting from a latent purulent otitis which, no doubt, was aggravated by the operation. The third was that of a child with numerous malformations and an enormous cardiac dilatation.

Complete separation of the sutures after the operation occurred eight times. Attempts at secondary suture were always unsuccessful. In three cases the failure was due to scarlet fever or diphtheria. Apparently children with wounds of the oral cavity are particularly susceptible to such infections. Therefore the operation should be delayed if there is the slightest possibility of such an infection. In two cases the failure was attributed to the novocaine-adrenalin anæsthesia which led to necrosis of the lip edges. In one case a chromic catgut suture was used and the result was poor because the catgut was absorbed much too soon. Subsequent operations may improve the results, but the function of the soft palate remains poor because of the greater tension.

There were fourteen partial failures but in three-fourths of these cases a complete closure was obtained by subsequent correction though function frequently remained diminished. Defects lying in the center can be brought to closure secondarily by dabbing with tincture of cantharides. Secondary operations are best done three months after the first operation. Relaxation incisions should be made on both sides. For secondary closure of anterior fistulæ the anterior bridge must be divided transversely 5 mm. behind the alveolar process and the flaps approximated by lateral relaxation incisions. The rarer lateral fistulæ are more difficult to overcome but even in such cases it may still be possible to effect closure by the formation of bridge flaps.

Smooth primary healing was obtained in fifty-five cases. The total number of anatomical unions, including those which were secondary, was sixty-five. The best results were obtained when the operation was performed on patients between 1 and 3 years of age.

In conclusion the author again emphasizes the fact that the number of failures can be diminished by the two-stage operation, but they cannot be avoided entirely even by perfect technique. In very rare cases the true velum retracts to a thin lamella after freshening of the cleft edges of the soft palate, and in this way an irregular wound surface is formed, which makes accurate suture very difficult. As the ultimate functional result must always be kept in mind, the author is opposed to all the numerous complicated plastic methods of closure. Under all circumstances, a long and movable velum capable of closing the nasopharyngeal space must be obtained.

In the after-treatment instruction in speech is essential. When a plastic operation has not been

successful good results in regard to speech can be obtained by the insertion of a well-fitting obturator.

SCHUBERT (Z)

NECK

Frank, L. W.: Observations on the Diagnosis and Treatment of Toxic Goiter. *Internat. J. Surg.*, 1921, xxxiv, 426.

In the author's opinion thyroid disease should be suspected in a patient with tachycardia, nervousness, or muscular weakness. He cites a case with these symptoms in which hyperthyroidism was not suspected at first. The basal metabolism was 28 per cent above normal. The adrenalin test was positive. Right lobectomy and partial left lobectomy resulted in improvement and a drop in the pulse rate to 80 per minute within twenty days.

Only a small percentage of toxic goiters have eye signs, such as exophthalmos or the Stellwag, Dalrymple or von Graefe signs. Some of the most toxic goiters are small and hard. An X-ray examination for substernal thyroid or thymic enlargement is important. The author agrees with Blank of Leipzig that there are no blood changes, such as a lymphocytosis, which are characteristic of toxic or simple goiter.

In all of Frank's cases diagnosed clinically as toxic goiter the basal metabolism was definitely increased. In one case of colloid goiter the metabolic rate was 55 per cent above normal. Increased metabolism is suggestive in a suspected thyroid case but the diagnosis should be based on the clinical symptoms and findings.

The amount of increase in the basal metabolism gives an idea of the severity of the intoxication but does not indicate the operability of the case. Some patients with a good myocardium can be treated by operation successfully, whereas others with only a slightly increased metabolic rate but with diseased heart muscle cannot undergo operation safely. Clinical symptoms and surgical experience are the best guides to the method of treatment. To illustrate this point the author cites a case with a basal metabolism 35 per cent above normal, a moderate reaction to adrenalin, and nodular enlargement of the thyroid, but a poor myocardium which contraindicated operation. Under treatment by rest and suitable cardiac stimulants the patient improved sufficiently to perform ordinary duties.

The adrenalin (so-called Goetsch) test was positive in all except two of the author's cases which were diagnosed clinically as toxic goiter. Colloid or non-toxic adenomatous goiters gave no response. Frank believes that the adrenalin test indicates the operability and degree of intoxication fairly accurately.

Although rest and proper hygiene are very important in cases of hyperthyroidism, it is the author's opinion that the treatment is essentially surgical. Thyroidectomy is the method of choice. When the X-ray is used the patient improves during treatment but recrudescence soon occurs when the radiation is discontinued.

WALTER C. BURKET, M. D.

Bérard, L., and Dunet, C.: Is There Such a Condition as Metastatic Goiter? (*Le goitre métastatique existe-t-il?*). *Rev. d. chir.*, Par., 1921, xl, 521.

In contradiction to all knowledge concerning the pathology of tumors, many surgeons and a number of anatomo-pathologists have described and continue to describe as "benign metastatic goiter" a condition which, under the form of a benign neoplasm, forms 'metastases in the same manner as an essentially malignant neoplasm. This idea of benign metastatic goiter was introduced into thyroid pathology by the error of Conheim who described as benign a tumor demonstrated by Woelffler to be malignant. The error then persisted because the great majority of goiters reported as benign had not been examined microscopically at all or had not been subjected to a thorough examination with the microscope. When microscopic study is carried out with the necessary care it often shows that a thyroid which appeared clinically normal is histologically neoplastic and this fact is a definite argument against the theory of benign metastatic goiter.

The authors illustrate these points by a number of the cases which have been reported in the literature. In 1914, Crone reported six cases of thyroid metastases observed in cases of goiter showing no clinical signs of malignancy. In three of these cases in which the thyroid was examined the histologic evidence of thyroid epithelioma was clear. The authors therefore conclude that there is no such condition as metastatic goiter; that the so-called "benign metastatic goiter" is in reality a malignant goiter; that the thyroid gland is no exception to the general laws governing the evolution of tumors; and that only malignant thyroid neoplasms form metastases.

In cases of tumors which show thyroid tissue under microscopic examination it is necessary to look immediately for a change in the thyroid gland itself. Frequently a voluminous goiter or a small adenomatous nodule which is clinically benign will be found. In such cases the absence of clinical signs of malignancy does not necessarily indicate that the growth is benign. Only a histologic examination of sections in series including the entire growth can settle the question. The microscope sometimes makes evident microscopic points of neoplastic degeneration which will be found only if they are sought systematically.

"Benign metastatic goiter" cannot be included among benign thyroid tumors. In its place should be substituted "latent metastatic thyroid cancer."

W. A. BRENNAN.

Speese, J., and Brown, H. P., Jr.: The Malignant Degeneration of Benign Tumors of the Thyroid Gland. *Ann. Surg.*, 1921, lxxiv, 684.

In 426 lesions of the thyroid gland, cancer was found nineteen times and sarcoma three times. There were five cases in which a history of goiter preceding the development of cancer could not be elicited

and no evidence of previous diseases could be found in the pathologic examination. Therefore a pre-existing goiter was present in twenty-two of twenty-eight cases (78.5 per cent). As a rule a rapid increase in the size of a goiter which previously has given no trouble is the first sign of malignancy. The growth becomes irregular and there is a decided increase in its hardness.

Cancer in a non-goitrous thyroid is very rare. A small movable tumor is usually the earliest finding and this may appear in any part of the gland. Its growth, which at first is slow and without alarming symptoms, suddenly becomes active, infiltrating the thyroid and surrounding parts and causing the characteristic symptoms of malignancy. Acute enlargement in young people, at a time when physiological activity of the gland subjects it to sudden changes, is not so serious as in the old. Enlargements in those over 30 or 40 years of age should be regarded with suspicion.

When cancer develops in a thyroid affected with goiter, a subacute course usually is followed. The period between the primary enlargement of the goiter and the extracapsular extension of the cancer, the period when operation should be performed because metastasis or infiltration has not occurred, is difficult to determine. According to Carrel-Billard, the development of cancer alters the thyroid secretion so that an increase or decrease of thyroid function may appear under variable conditions.

The reaction of the organism to the toxæmia of thyroid cancer is classed under three heads: (1) hyperæmia, in which a rising temperature up to 39 degrees C. may precede the appearance of the tumor, (2) symptoms of Basedow's disease, and (3) disturbance in nutrition manifested at first by loss in weight.

The authors conclude that benign tumors of the thyroid gland preceded the development of malignancy in practically all cases.

Cancer is found most frequently associated with colloid and fetal adenomata, and is relatively uncommon in simple goiters.

To prevent leaving behind a small adenomatous nodule from which malignancy may develop at a later day it is necessary to make a thorough exploration of both lobes of the thyroid.

When cancer is present clinically and the diagnosis can be made easily, operative measures offer but little hope. The majority of cases are discovered in the course of operation or in pathologic examination. The greater number of such cases are cured by operation.

In all cases of goiter early operation is indicated to prevent malignant degeneration.

Toxic symptoms, which occasionally develop in cancer, may precede the appearance of the malignant tumor and obscure the diagnosis.

Enlargement of a pre-existing goiter and an increase in its hardness are the first signs of carcinomatous degeneration of a benign struma.

I. W. BACH, M. D.

Van Hook, W.: A Simple and Relatively Safe Thyroidectomy. *Med. Rec.*, 1921, c, 1072.

One of the most serious difficulties associated with the treatment of goiter lies in the determination of the amount of tissue to be removed. The old procedure of removing one lobe is inadequate, but the dictum that one-fifth of the thyroid mass should be left is equally unsatisfactory.

Recently the author has left small masses at each of the horns of the organ and, in addition, a thin layer of thyroid tissue attached to the posterior untouched part of the gland capsule. These are left by choice because their volume can be rather accurately gauged and because they are well provided with blood vessels and lymphatics which allow for hypertrophy if this is demanded by the organism.

Kocher's collar incision is made a finger-breadth above the sternum and at a level which will give the best access to the horns of the gland. The platysma is divided and the sternothyroid and sternohyoid are retracted or transversely sectioned. The half of the gland chosen as the first to be attacked is lifted out between the thumb and first finger, firm and fairly deep retraction is made, and the cornu is isolated and divided between clamps. The lower lobe is divided between forceps in the gland substance and the main mass of the gland is shaved from the posterior capsule. The capsule is then closed, the muscles are sutured, and the skin is closed around a drainage tube. The drain is removed at the end of twenty-four hours.

H. A. McKnight, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Keyser, L. D.: Massive Hypertrophy of the Breast. *Surg., Gynec. & Obst.*, 1921, xxxiii, 607.

The author reviews clinical and experimental data on factors affecting mammary development and function. The breasts develop from a modified group of sudoriparous glands and their development and function are under the control of endocrine forces. Puberty hypertrophy is dependent on ovarian activity. A definite cycle of mammary activity runs somewhat parallel to the menses. There is suggestive evidence that the formation, persistence, or regression of the corpus luteum may influence the activity of the breast in the pregnant as well as the non-pregnant state. There is no good evidence to prove that the uterus, decidua, foetus, or placenta are directly related to mammary function.

Massive hypertrophy of the breast is a deviation from normal development. The process does not suggest a neoplasm as it is diffuse and seems to affect all portions of the organ uniformly and simultaneously. The age of onset in one-half of the bilateral cases is under 18 years. The process is associated most frequently with puberty and next most frequently with pregnancy. The cases of patients as old as 48 years have been reported, although with an increase in age there is a marked drop in the incidence of the condition. As a rule the process is bilateral. When it is unilateral both sides of the breast are about equally affected.

The secretory activity of hypertrophied breasts is variable. Usually it is normal, but may be either absent or excessive. The rate of growth may progress uniformly or intermittently. Pain is not frequent.

The relationship of hypertrophy of the breasts to the menses, to pregnancy, and to lactation, and its association with pathologic conditions of other sexual organs are considered with citations of typical cases. In some cases spontaneous regression occurs.

The author suggests that terms such as "diffuse virginal hypertrophy" and "gravidity hypertrophy" are inexact.

Thickening of the skin, flattening of the nipple, hypertrophy, fibrosis, diffuse fibro-epithelial tumor associated with fibro-adenoma are features described in the literature. Malignancy is rare but has been recorded.

Pathologically most cases are fibro-epithelial (frequently associated with fibro-adenomata) or adipose. Two cases of each type from the Mayo Clinic series are reported in detail. The patients with fibro-epithelial hypertrophy were a girl of 15 years and a woman of 36. In the woman the hypertrophy began with pregnancy. The adipose hypertrophies occurred in a virgin of 19 years and a parous woman of 41 years, but in the latter case was not associated with pregnancy. The adipose type is rare; only four cases have been recorded previously.

The fibro-epithelial hypertrophies were associated with fibro-adenomata, succulence of the preponderant fatty tissue, rapid proliferative changes in the fibro-adenomata, and reproductive activity in the mammary acini (primary cytoplasia of MacCarty). The acinar groups were invaded and broken up by growing fibrous tissue.

The adipose type was characterized by the relative absence of acini and a preponderance of fat. A few fibrous bands traversing the fat carried a moderate number of acini showing primary cytoplasia. The epithelium in both types was hypertrophied to a variable degree.

The etiological factors are not clearly understood but the evidence suggests an endocrine dyscrasia probably of the ovarian type.

To be differentiated in the diagnosis are intracanalicular myxoma and fibroma, sarcoma, elephantiasis, and the fatty breasts of obesity.

If spontaneous regression fails to occur after a reasonable length of time, surgical amputation may be indicated.

MISCELLANEOUS

Watts, S. H.: Traumatic Chylothorax. *Ann. Surg.*, 1921, lxxiv, 691.

Watts presents a case of traumatic chylothorax. Milky effusions in the serous cavities are quite uncommon. They occur most frequently in the peritoneum, are less frequent in the pleura, and are very rare in the pericardium. Milky pleural effusions are of two varieties: (1) the true chylous, due to the escape of chyle into the pleural cavity through a thoracic duct lesion, and (2) the chyloid, due to simple or tuberculous pleuritic effusion, abscess of the lung, carcinoma of the pleura, lymph vessels and lymph glands, extreme cardiovascular changes, and a few other conditions.

True chylous exudates show all the properties of chyle. The fluid is usually white and milky, but sometimes reddish because of the presence of blood. It tends to accumulate rapidly, resists putrefaction, does not coagulate on standing, contains fine fat globules which may be readily stained with osmic acid or Sudan III, and clears when alkalized and shaken with ether. The specific gravity generally exceeds 1.012. The fat content is usually high, varying from $\frac{1}{2}$ to 4 per cent. In most cases there is a definite sugar reaction. Lecithin is found only in traces.

The chyloid effusion accumulates less rapidly, is less milky, contains much less fat, sometimes only a trace, and is not so completely cleared by shaking with ether. The cellular elements may be numerous and frequently they contain fat. The specific gravity is usually less than 1.012. It contains serum albumin, and a complex of lecithin and globulin to which its opacity is attributed, and traces of sugar.

The more frequent occurrence of chylothorax on the right side is not surprising considering the anatomical relations of the duct and the right pleura. As the right pleura is in close approximation to the duct, forces which affect the duct are apt to injure both

structures. Some authors, notably Hammesfahr, are of the opinion that, because of the negative pressure in the chest, chyle may escape into the pleura from the mediastinum through the normal intercellular spaces between the endothelial cells. The author believes that this is the only explanation of the presence of chyle in the pleural cavity in the case reported as there was no injury of the right pleura.

Most cases of traumatic chylothorax are due to violent, blunt force exerted upon the chest and back, and many are associated with fracture of the ribs or vertebræ. In some instances, however, there is no evidence of bony injury and the rupture of the duct is due probably to alterations in the intrathoracic pressure or to overstretching of the duct, its state of fullness possibly being of some importance in the etiology.

The clinical manifestations of chylothorax are those of simple pleural effusion. The diagnosis may be made by aspiration but in some cases the fluid so obtained has been mistaken for pus. A careful microscopic and chemical examination will give definite findings. In non-traumatic cases there are seldom any subjective symptoms except dyspnoea and weakness.

The prognosis of traumatic chylothorax is very grave. Regarding the treatment it may be said that radical surgery to find and close the opening in the duct is scarcely practical. Aspiration should be done only when the pressure symptoms are very marked as the relief of pressure may increase the leakage from the duct. Thoracotomy is not to be recommended. Hall and Morgan claim that all the injured duct needs for recovery is rest, and that this may be secured by feeding through the rectum exclusively, the food thus given being absorbed by the colonic lymphatics which pour their contents into the general superficial and peripheral lymph channels instead of the lacteal system. The author does not believe that experience will bear this out.

I. W. BACH, M. D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Gordon, M. B., and Golan, D. L.: Traumatic Diaphragmatic Hernia in a Girl 8 Years of Age. *Am. J. Dis. Child.*, 1921, xxii, 579.

In the case reported an automobile truck passed over the patient's left groin. Seven months after the injury a diagnosis of diaphragmatic hernia of traumatic origin was made on the basis of the X-ray findings and an operation was performed. When the thorax was opened it seemed as if the abdomen had been exposed to view as the small and large intestines, the stomach, and the left lobe of the liver had entered the chest through a large rent in the diaphragm.

The author's conclusions are summarized briefly as follows:

1. In every case of either true or false dextrocardia a roentgen-ray examination of the gastrointestinal tract should be made with barium.

2. Every patient with dextrocardia should be examined completely in both the erect and the supine positions.

3. A careful history should be obtained in every case of dextrocardia, especial emphasis being placed on injury of the abdomen.

4. The possibility of traumatic diaphragmatic hernia should be considered in cases of severe abdominal injury when there is an increase of intra-abdominal pressure.

5. Because of the possibilities of strangulation, immediate operation is indicated in every case of traumatic diaphragmatic hernia.

FREDERICK CHRISTOPHER, M.D.

Forster, E.: Genuine Cysts of the Mesentery (Ueber genuine Cysten des Mesenteriums). *Beitr. z. klin. Chir.*, 1921, cxxiv, 116.

Of the three types of mesenteric cysts, true cysts, foreign body cysts, and cystoids (traumatic softening and liquefaction cysts) this article takes into consideration only true cysts. To these belong first of all the lymphangiomata (cavernous and cystic) originating in abnormal dilatation of the lymphatic vessels and generally of congenital origin. On account of anastomosis with the chyle ducts or because of cell degeneration their contents are usually chylous, and when there has been hæmorrhage they are sanguinous. From their contents, therefore, it is impossible to draw a conclusion regarding their origin.

In a case reported by the author a cyst of the transverse mesocolon was found which contained 10 liters of a brownish yellow clear fluid. Following resection of the mesocolon the patient died of peritonitis.

Forster has found in the literature twenty-five cases of cysts originating in the omphalomesenteric duct. These are formed by encapsulation of a Meckel diverticulum having no open connection with the skin or the bowel. Their walls include all the layers of the bowel or consist of thin flat epithelium. Their contents are mucinous.

Cysts originating from the wolffian duct are characterized by the presence of ovarian, kidney, or adrenal tissue. Simple dermoids are rare. Usually these are small, solid retroperitoneal tumors but they may also migrate into the mesentery of the small bowel. The complex dermoid cysts are still more rare. Some of them probably have their origin from completely separated ovarian cysts but others arise from the testicle. They contain derivatives of all the germinal layers; besides the ectodermal products there are also rudimentary parts of the nervous system, brain, cartilage, bone, gastro-intestinal tissue, and vascular system. Finally there are the foetal inclusions in which amniotic membranes may be seen, and the teratoid mixed tumors originating either in displacement of primary layers or of a bi-germinal nature. As the former they contain tissue from all three germinal layers, but show no typical structure. They are found more often in females than in males.

In the differential diagnosis ovarian cysts can be diagnosed by their relationship to the genitalia; hydronephroses and Grawitz tumors, by the kidney shape of one of their poles as well as by the cystoscopic demonstration of lack of function in the diseased kidney; pancreatic cysts, by disturbance of the pancreatic digestion; and omental cysts, by their early adhesion to the abdominal wall. Walled-off peritoneal inflammations become flattened during anæsthesia.

Simple dermoids and enterocystomata are found most commonly in the mesentery of the small intestine, but all of the others may also develop here. Foetal inclusions are found usually in the transverse

mesocolon, and complex dermoids in the ascending colon. Mesenteric cysts may lead to ileus through torsion or invagination. If at all possible, these cysts should be radically extirpated. If this is impossible because of extensive adhesions or the patient's poor general condition, they should be sutured to the abdominal wall and drained by the formation of a fistula.

SIEVERS (Z).

Pitzman, M.: A Fundamentally New Technique for Inguinal Herniotomy. *Ann. Surg.*, 1921, lxxiv, 610.

The author's operation consists essentially in the suturing of the transversus fascia and aponeurosis (and only these layers) down to the inguinal ligament of Poupart before the peritoneal cavity has been closed. Pitzman believes that this technique is applicable to all inguinal herniæ, small or large, primary or recurrent, and especially to medium and large-necked herniæ. The underlying principle is the reproduction of physiological valve action by: (1) resection of the hernial sac, (2) repair of the enlarged opening in the transversus (transversalis) fascia, and (3) avoidance of injury to the internal oblique and transversus muscles.

FREDERICK CHRISTOPHER, M.D.

GASTRO-INTESTINAL TRACT

Luis-Yague y Espinosa, J.: A Method for the Topographical Diagnosis of Ulcerations of the Digestive Tract (Algunas aclaraciones a un método de diagnóstico topográfico de las ulceraciones del tractus digestivo). *Arch. españ. de enferm. d. apar. digest.*, 1921, iv, 662.

In an active ulceration there is always inflammation of the peripheral mucosa with abundant secretion of mucus which engulfs any hæmatin present and renders it insoluble in water or a weak acid solution such as is found in the stomach and the first portion of the duodenum. Therefore a laboratory test for blood (hæmatin) made on the gastric or duodenal contents may be negative. On the other hand, both mucus and hæmatin are easily soluble in a weak alkaline medium. Before analyzing the gastric contents, therefore, Meunier injects into the stomach 200 c.cm. of water or physiologic salt solution containing 10 drops of ammonia. In addition he gives three spoonfuls of pulverized carbon and examines the fæces for occult blood after twenty-four hours.

The author proposes certain changes in Meunier's method which he believes will make it more accurate. He suggests increasing the amount of the fluid for the gastric lavage from 200 to 500 c.cm.; the use of carbon in the form of pastilles; and the administration of some milky food a few minutes after the lavage. As the patient is already on a milk diet, the fæces from the early and later diets can then be differentiated easily. The author has found this method of seeking occult blood very much more satisfactory than others in general use.

W. A. BRENNAN.

Oberndorfer: A Pedicled, Cavernous Lymphangioma of the Outer Surface of the Stomach (Ein pendelndes, cavernoöses Lymphangiom der Aussen-seite des Magens). *Beitr. z. path. Anal. u. z. allg. Path.*, 1921, lxi, 418.

The usual site of circumscribed lymphangioma is the abdominal cavity and the retroperitoneal space. The author discovered a pedicled cavernous lymphangioma of the serosa of the stomach as a secondary finding in an autopsy on the body of a man 19 years of age. This growth, which was a flat tumor as thick as the hand and as large as the palm, lay over the sinus and canal of the pylorus in the middle third of the anterior wall of the stomach. It hung by a pedicle from the lesser curvature, could be completely detached from the gastric surface, and was connected with a formation the size of the palm of the hand which lay upon the posterior wall of the stomach.

COLLEY (Z).

Rowlands, R. P.: A Case of Partial Pyloric Stenosis (Hypertrophic); Finney's Operation. *Lancet*, 1921, cci, 1373.

The case reported was a typical instance of partial stenosis due to spasm and hypertrophy of the pyloric sphincter. The pyloric channel was partially obstructed by the usual infolding and thickening of the submucous tissue, but there was no sign of active or healed ulceration.

The author believes the clinical history is characteristic. The patient was well while at rest under observation at the hospital, and the attacks came on after undue exertion and fatigue. The diagnosis of the condition is difficult. In Rowland's opinion, the Rammstedt operation, which is so successful in the treatment of children, is not suitable for adults because the fibrous changes in the pylorus of the adult—especially when the condition is advanced—require a more radical operation. For such cases Rowlands prefers the Finney operation.

E. C. ROBITSHEK, M. D.

Cheever, D.: The Pathological and Physiological Basis for the Surgical Treatment of Chronic Gastric Ulcer. *Boston M. & S. J.*, 1921, clxxxv, 707.

Reasoning from the results of laboratory experimentation, Cheever concludes that physical trauma is not an important element in the causation of ulcer. From Rosenow's experiments it would seem that foci of infection elsewhere in the body may be responsible by causing bacterial embolic infarctions; clinical proof, however, is difficult to obtain.

The greater frequency of ulcer along the lesser curvature of the stomach and in the duodenum may possibly be explained by the peculiar arrangement of the arteries in these regions favoring venous stasis and failure of compensatory circulation in case of injury.

That the failure of ulcers to heal is due to auto-digestion of the injured tissue is indicated by the fact that ulcers occur only in the stomach, the portion of the duodenum proximal to the opening

of the bile and pancreatic ducts, and in the jejunum at or just beyond the stoma of the gastro-enterostomy, regions where the acid pepsin is active. The clinical association of hyperchlorhydria with ulcer and the relief and cure of ulcer by neutralization by alkalies supports this view.

Some authorities maintain, however, that this assumption is not warranted by experimental laboratory or clinical facts as unhealed ulcers have been found in stomachs free from acid pepsin and without ulcer symptoms, and if the mucosa is intact and bile is not present, hydrochloric acid of ten times the normal concentration may be introduced into the stomach of the experimental animal without producing ulcer. Moreover, in cases of unhealed ulcer, acid of five times normal strength will not cause symptoms in the quiescent stage. An acid medium is normal for the gastric mucosa. Such being the case, prolonged alkalization may lead to a compensatory over-acidity of the acid cells and the ultimate degeneration of the mucosa.

In Cheever's opinion the factors entering into the formation of gastric ulcer are similar to those causing chronic ulcers elsewhere. The chronic indurated varicose ulcer of the lower leg fails to heal, first, on account of infection and irritation resulting from lack of rest and circulatory impairment due to the varicosity of the vein. If these conditions are not corrected, the vascular granulation tissue base is replaced by a thick layer of dense fibrous tissue through which no vessel can penetrate adequately to nourish regenerating epithelium. Rest, disinfection, and operation on the varicose veins may fail to secure healing, but if the fibrous base is widely excised to give free access to vigorous new vessels spontaneous healing will result.

The pain of chronic ulcer is caused by the chyme, acid or hyperacid, which passes into the duodenum and initiates an excessive reflex inhibition of the relaxation of the pyloric sphincter so that relief of the intragastric pressure is not afforded and increased tension results. The pylorospasm causes delay in the emptying of the stomach which in itself causes hypersecretion and this in turn causes more ulcer irritation from which more vigorous peristalsis and more obstinate inhibition of sphincter relaxation results, a vicious circle of disordered physiology.

Surgery attacks the pathologic process directly and effects a cure by removing it, at the same time attempting to correct the physiological disfunction by forming a permanent artificial anastomosis. Excision of an ulcer at the pylorus almost anywhere on the lesser curvature except the highest part, and almost anywhere on the anterior surface of the stomach is usually practicable, and transgastric resection of a penetrating ulcer of the posterior wall, though more formidable, can usually be carried out unless there are unusual complications.

In cases of duodenal ulcer the question of excision is modified by three considerations: (1) the technical difficulty of excision on anatomical grounds; (2) the possibility of effectively excluding the ulcer

by proximal closure of the viscus; and (3) the great rarity of carcinoma in this situation. While many favorably situated duodenal ulcers may be excised, their removal need not be insisted upon as the complete rest and freedom from hydrochloric acid digestion afforded by exclusion make it unnecessary.

The surgical correction of pathologically altered gastroduodenal physiology is obtained by two similar methods, each of which has its advocates: (1) gastrojejunostomy with some form of pyloroplasty, and (2) gastroduodenostomy. These expedients secure more prompt emptying of the stomach, neutralize the acid gastric juice to some extent by its admixture with the duodenojejunal contents, cause relaxation of pylorospasm, and prevent hypersecretion by preventing retention.

C. CORBIN YANCEY, M. D.

Klein, E.: The Persistence of Gastric Ulcer After Gastro-Enterostomy. *Ann. Surg.*, 1921, lxxiv, 740.

Although during recent years there has been an increasing tendency to treat gastric ulcer by more radical procedures than gastro-enterostomy, Sherren has stated that in the majority of cases gastro-enterostomy is still the operation of choice, and this procedure is favored by Paterson, Coffey, Metraux, Zacherl, Landes, Borchgrevink, Kuttner, Rowlands, Gallart, and Ribas. However, the frequent occurrence of the following late sequelæ is leading to increasing dissatisfaction:

1. Hæmorrhage. In one-half of the cases the bleeding probably has its origin in the unhealed ulcer.

2. Perforation of an unhealed ulcer. This has been reported by several operators.

3. Carcinomatous degeneration of an ulcer. The difficulty in distinguishing the beginnings of malignancy at operation seems to warrant the routine removal of all ulcers.

4. Persistence or recurrence of gastric symptoms. These sequelæ incline the author to the view, now steadily gaining ground, that whatever procedure is used it should include the removal or destruction of the ulcer if this is at all possible.

In conclusion Klein states that it is unfair to compare the mortality statistics of partial gastrectomy and gastro-enterostomy as the former operation can cure severe cases in which the latter is entirely without effect.

J. D. ELLIS, M.D.

Molodaja, E.: Gastric and Duodenal Ulcer According to the Material of the Surgical Clinic of the University of Moscow (Das Magen-und Duodenumgeschwuer nach dem Material der Moskauer chirurgischen Universitaetsklinik). *Mediz. J.*, 1921, i, 385.

This report is based upon 124 cases of gastric and duodenal ulcer which were treated during the period from September, 1910, to January, 1921, by gastro-enterostomy. There were eighty-six cases of gastric ulcer, twenty-eight cases of duodenal ulcer, and ten cases of gastroptosis and gastric dilatation.

Among the subjective symptoms in cases of ulcer, the author considers those of dyspepsia and pain as the most important. The obstipation, which always disappears after a successful operation, is characteristic. Objectively, increased tension of the upper parts of the rectus muscle, hyperacidity, and blood in the gastric contents and fæces are demonstrated. The diagnosis of peptic ulcer is usually easy, but the differential diagnosis between gastric ulcer and duodenal ulcer is very difficult. This is due partly to the fact that both ulcers are present simultaneously, that in the majority of cases they are multiple, and that frequently at operation perigastritis is found with duodenal ulcer and periduodenitis is found with gastric ulcer.

The material of the Surgical Clinic of the University of Moscow consists mainly of chronic ulcers, many of which have bled profusely shortly before the operation. In spite of this fact, the ulcer was not always found at operation, even when the stomach was opened. The majority are cases of simple ulcer. Callous and perforating ulcers are rare. Usually there are characteristic changes of the serosa, such as adhesions, cicatrices, hyperæmia, and infiltration. The adhesions are often very extensive. As a rule all these changes are localized at the pyloric and prepyloric portions, but in some cases the inflammatory process involves the small intestine, which then appears adherent to the posterior gastric wall. Not rarely, swollen, soft lymphatic nodes are found in the small omentum. In two cases the mesocolon was markedly oedematous, and in two others there was slight ascites. Usually the stomach is dilated and sunken, the gastrohepatic ligaments are stretched, and the liver also is ptotic. The gastric mucosa is sometimes smooth and atrophic, but sometimes hypertrophic. The veins are often markedly dilated. Microscopic examination usually reveals atrophic or hypertrophic changes.

The question of the etiology is still unanswered. According to the material reviewed, the condition is most frequently referred to some trauma, and apparently is dependent upon an irregular diet, coarse food, and psychic trauma. In individual cases, intoxication comes up for consideration as an etiological factor. In almost all cases, exacerbations and recurrences follow physical exertion and trauma. Very often the lesion appears simultaneously with appendicitis (12 per cent). More often, tenderness is found in the ileocaecal region. Even if there is a relationship between these two conditions, as is claimed by Americans, no improvement was noted in the course of one of them after operative treatment of the other.

Males are attacked more frequently than females (3:1). The ages of the patients ranged from 30 to 50 years. The effect of heredity was very frequently demonstrated (25 per cent). Gastric conditions of various kinds were often found in several members of the same family.

The author discusses the various theories regarding the value of gastro-enterostomy and the different methods which have been proposed as substitutes for this operation. In Molodaja's opinion, even resection of the stomach does not offer absolute assurance against fatal hæmorrhages and perforations from ulcers overlooked during the operation. The frequent recurrences after resection and other findings indicate that gastric ulcer should be considered as a constitutional disease and the best treatment is that which removes the causative factor. The material presented does not indicate that gastro-enterostomy should be given up, but the most frequent complication following this operation, cicatricial stenosis of the anastomosis, must be borne in mind as it is apt to discredit the procedure. It should be remembered also that the patient should be given dietetic treatment for two or three months after the operation as gastro-enterostomy acts only to favor healing of the ulcer and does not remove it. Fatal hæmorrhages or perforations do not occur at the Moscow Clinic. The end-results could be determined in only 40 per cent of the cases operated upon as the other patients could not be found. Gastro-enterostomy is indicated in all cases of ulcers of the stomach and duodenum.

Posterior gastro-enterostomy is to be considered the method of choice. The prepyloric portion is selected for the anastomosis, and the connection with the small intestine is made directly at the duodenojejunal fold. The anterior gastro-enterostomy of Woelfler combined with the entero-anastomosis of Braun is used only when posterior gastro-enterostomy is impossible. Altogether, there were 124 operations. In three cases the Woelfler-Braun anterior gastro-enterostomy was done; in three cases, the posterior operation of Petersen with pyloric closure; in three, the posterior operation of Hacker-Braun; in one, a gastroduodenostomy; and in the remainder, the posterior gastro-enterostomy of Petersen. Six patients died after the operation; five of them were very much weakened from severe hæmorrhages. Of the remaining 118 patients, ninety-one showed an immediate good result and the twenty-seven others were benefited. The following complications were noted: loosening of the sutures in four cases; atony of the stomach in two; hæmatemesis in four; and contraction of the anastomosis in two. Pulmonary complications were frequent. The total acidity and the amount of free hydrochloric acid were usually diminished after the operation, and bile could always be found in the gastric juice.

Permanent results were found in 37.5 per cent of the cases. In forty cases (71.4 per cent) the results were good, in ten (18 per cent) there was improvement, and in two (3.5 per cent) the results were poor. Death occurred in four cases: in three, from intercurrent disease, and in one case from what was believed to be a gastric carcinoma. There were four cases each of postoperative hernia and con-

traction of the anastomosis. In one case the stenosis was caused by contraction of the suture of the mucosa. After removal of the suture the stenosis disappeared. In a second case there was cicatricial contraction in the mesocolon, and in a third case a peculiar tendency of the gastric wall to form plastic processes. In the Moscow Clinic stenosis has been successfully treated up to the present time by lengthening the incision.

The material described indicates that posterior gastro-enterostomy is the method of choice for ulcers of the stomach and duodenum. Resection should be done only on callous ulcers suspected of malignant degeneration. To obtain good permanent results, dietetic treatment should be given for two or three months after the operation.

VON HOLST (Z).

Gibson, A. G.: The Pathology of Gastric and Duodenal Ulcer. *Brit. M. J.*, 1921, ii, 933.

In experiments on monkeys to study the pathology of gastric and duodenal ulcer one of the animals was injected intraperitoneally with a broth culture of streptothrix actinomyces obtained from a case of acholuric jaundice. At necropsy thirty-two weeks later this animal showed a chronically inflamed and fibrotic spleen with thrombophlebitis; multiple gastric ulcers; hæmorrhagic spots and occult blood throughout the lower intestinal tract; and hæmorrhagic and embolic lesions of the liver and lungs.

As observed by W. J. Mayo, about 30 per cent of the venous blood from the spleen may return by way of the vasa brevia of the stomach wall. It is not difficult to imagine, therefore, that the stomach wall is subject to invasion by septic emboli originating in a diseased spleen.

In the clinical conditions known as acholuric jaundice and splenic anæmia, more especially the latter, we often find marked anæmia and hæmatemesis. Both diseases are undoubtedly due to an infective lesion in the spleen.

The author concludes that in a small proportion of cases of acholuric jaundice and splenic anæmia the gastric hæmorrhage may be due to septic or infective emboli originating in a diseased spleen and lodged in the gastric mucosa by way of the vasa brevia of the gastric wall. L. H. FOWLER, M. D.

Webb, R. G.: Disconnecting Gastro-Enterostomy Stomata; A Clinical and Experimental Study. *Surg., Gynec. & Obst.*, 1921, xxxiii, 681.

Webb states that a gastro-enterostomy should not be performed unless the definite indication or lesion is demonstrated at the time of operation. Persons subjected to gastro-enterostomy unnecessarily present symptoms of a vicious circle with continuous and frequent vomiting of bile-stained material and abdominal pain and distress. There seems to be no non-operative relief for this condition.

The disconnecting of gastrojejunal stomata should be preceded by most careful clinical and

laboratory studies. Numerous methods are used, but there is as yet no standardized procedure. The chief problems are: (1) the restoration of the organs to their normal positions and mobility with as few adhesions as possible and (2) the prevention of constriction of the lumen of the jejunum.

The Andrews operation with slight modifications should become a standardized procedure as long as the indiscriminate use of gastro-enterostomy without indication is continued. This operation is as follows:

After lifting of the transverse colon and exposure of the line of union to the bowel, the rubber-covered clamps are placed on each viscus, a free space for operation being left. The incision is made upon the stomach wall 1 cm. from the line of anastomosis so that a cuff of stomach is left entirely around the false opening in the bowel. When the jejunal opening is closed there is just enough tissue to bring the bowel to its normal diameter when two or three rows of inversion stitches have been placed. The stomach opening is closed by the usual method; the loss of tissue is of no consequence. The opening in the transverse mesentery is closed to prevent hernia and the operation completed.

In experiments on dogs no changes were noted in the stomach tissue transferred from an acid to an alkaline medium and deprived of its original blood and nerve supply.

H. A. MCKNIGHT, M.D.

Kaiser, F.J.: Are the Methods of Closure in Pyloric Exclusion, Especially Those Using Autoplastic Material, Preferable to Section? (Sind bei der Pylorusausschaltung die Methoden der Absperrung, insbesondere die mit autoplastischem Material, der Durchtrennung vorzuziehen?) *Muenchen. med. Wchnschr.*, 1921, lxxviii, 1413.

The pylorus was excluded in twenty cases by strapping it around with the ligamentum teres. The latter can be freed sufficiently to wind it twice around the isolated pylorus, which is 5 to 7 cm. wide, and then to tie it. The sling was immediately tightened to close the lumen. Infection and disturbance of nutrition of the gastric wall did not occur. The knot was fixed with a silk suture and the sling covered over with Lembert sutures.

The author believes that with this procedure a secondary cutting-through of the sling is prevented and permanent closure of the pylorus can be achieved. In cases controlled roentgenologically for two years the closure persisted. In two cases, however, severe symptoms re-appeared two months after the operation and the roentgenogram showed that the pylorus had again become patent. At a second laparotomy an extensive plastic inflammation was found in the region of the pylorus and its surroundings. The gastro-enterostomy easily admitted two fingers, and the pylorus one finger. Pyloric resection was done according to the Billroth II method. The fascial strip had not cut through the lumen; it had healed in smoothly but had become stretched. The author attributes the stretching to

the increased gastric peristalsis; the true cause of the postoperative trouble is perhaps to be sought in the stretched peripyloric adhesions for which the aseptic tissue stimulation of the transplant was responsible.

A pyloric resection (Billroth II) is advised, even when the ulcer is situated in the duodenum.

WORTMANN (Z).

Caminiti-Vinci, G.: Gastro-Enterostomy with Pyloric Exclusion by Parlaveccchio's Method in Gastro-Enteric Cancer (La gastroenterostomia con esclusione del piloro alla Parlaveccchio nel carcinoma gastro-enterico). *Polisclin.*, Roma, 1921, xxviii, sez. prat., 1683.

The author believes that when gastrectomy is contra-indicated in a case of gastropyloric cancer by the patient's condition or the stage of the disease, we must resort to gastrojejunostomy with pyloric exclusion. The pyloric exclusion must be simple. The various sectioning methods of Eiselsberg, Kocher, Doyen, Schiassi, and others complicate the main operation and increase its dangers, especially if the patient's general condition is poor. Plastic methods prolong the operation too much. Parlaveccchio's ligature method is the best.

The author used Parlaveccchio's method in the treatment of five cases of gastropyloric cancer. Three of these patients have been followed; the others were surgically cured and their general condition was improved when they left the hospital. Since then it has been impossible to trace them. Of the three traced, one died of the disease five and one-half years after the operation but was able to continue his work for four years. One remained well for fourteen months. In the third case, which was operated on four years ago, the X-ray shows that the food passes through the neostomy, the pylorus being completely blocked.

In the author's opinion his results compare very favorably with those of resection for the same condition, but the method he used is advisable only when resection is impossible.

W. A. BRENNAN.

Babcock, W. W.: Factors Determining the Efficiency of Operations upon the Stomach. *Illinois M. J.*, 1921, xl, 444.

There has been practically no change in the fundamentals of gastric operations in the past thirty years. No basis has been determined for the treatment of gastric ulcer by gastro-enterostomy although certain points in the method have perhaps proved of value, such as the formation of a short intestinal loop, the use of absorbable sutures, the formation of a free opening well toward the pylorus, and the maintenance of the jejunum free, unkinked, non-rotated, and well outside the lesser peritoneal cavity. The operation is perhaps a makeshift which is better for duodenal ulcers than gastric ulcers.

No definite guide has been determined for operating upon a gastric ulcer. An operation is performed because the surgeon likes it or devised it,

and as a result there is a new field of gastric pathology due to the intervention.

The stomach may be long and narrow, or short and wide, J-shaped, high up or low down in the pelvis and yet function well if there is no kink or distortion of the duodenum and if it is free and mobile within the peritoneum. Operations which fix the stomach may be harmful as are those which free the fixed and retroperitoneal duodenum and ascending colon. The loose attachment of the gastric mucosa to the muscularis favors plastic operations. Most of the glands secreting gastric juice are prepyloric. By flowing back into the stomach after gastric digestion is complete the duodenal and biliary juices tend to neutralize the acid of the stomach and place that organ at rest during the intervals between the ingestion of food. Bile does not produce nausea and is regurgitated only after all the irritating gastric contents have been discharged. Increased motility with its accompanying back-flow of bile tends to reduce the acid values, while retention and decreased motility, other things being equal, will increase the amount of free and combined acid in the stomach. Ingested alkalies, meats, and meat extractives increase the acid flow.

Gastric motility depends upon the intrinsic ganglia of Auerbach and the stimulating impulses through the vagi, the motor nerves of the stomach. Vagotonia may therefore produce pylorospasm and high values with symptoms of ulcer.

As the normal motion of the stomach is toward the pylorus, the food may pass through the pylorus even though a new opening is made. The back-flow of duodenal juices through the new opening may tend to neutralize the acidity, coat the stomach with mucus, and favor the healing of an ulcer.

The opening of the pylorus is stimulated by three factors besides the peristaltic waves: the acid chyme on the gastric side, the neutralization of the acid chyme on the duodenal side, and the ileopyloric reflex. The ileopyloric reflex prevents the passage of the chyme from the duodenum until it is neutralized and thus prevents congestion of the ileum. After the pylorus is destroyed the duodenal ring acts as a sphincter and therefore the best results are obtained by anastomosis of the stomach and duodenum above that muscle. For this reason the Billroth I operation is better than the Billroth II operation or the Polya partial gastrectomy.

The intestinal mucosa is protected from the acid gastric juice by the alkaline bile and duodenal secretions. The liability of ulcer formation in the small intestine normally decreases with the distance from the acid stomach. Jejunal ulcers are common only after anastomosing operations. If the bile and pancreatic juices are diverted from the duodenum, ulcers are common. This has been shown in experiments on dogs by Exalto by the production of jejunal ulcers in six of seven dogs when the duodenal flow was diverted into the colon following gastrojejunostomy.

Chyme causes acid reaction in litmus paper dipped in bile less rapidly and less completely than in other parts of the paper. Gastro-enterostomy is less effective for ulcers out of the direct flow of the regurgitated bile. Thus duodenal and pyloric ulcers heal more efficiently than those of the fundus or elsewhere. The author does a cholecystogastrotomy in the ulcer area and thus allows the bile to come into contact with the area of irritation. However, as only a few cases have been treated in this manner, no conclusions can yet be drawn.

Ulcers may require different treatment in different periods of their existence. Ulcers due to trauma or infection may persist when irritated by acid, but heal quickly after alkalization following gastro-enterostomy, pyloroplasty, or cholecystogastrotomy. In a chronic ulcer the sclerosed walls may prevent healing and thus make excision or the use of the cautery necessary. In some cases of chronic ulcer the author does a plastic operation on the mucosa, dissecting the ulcer layer by layer and covering it with healthy mucosa. This may be easier than a pyloroplasty.

The article is concluded with the following summary:

In order that postoperative pathology may be avoided, physiological methods should be used in stomach operations.

We should individualize in gastric ulcer treatment. Gastro-enterostomy is more logical when there is high acidity and increased motility, but more apt to produce secondary ulcer. It should always allow free access of duodenal fluid to the ulcer, and when there is hyperacidity should be placed as near the ampulla of Vater as possible. In cases of chronic ulcer with sclerosis, low acidity, and the absence of obstruction, excision or cauterization is preferable. Fixation of the stomach and gastroplication are of little value. Division or destruction of both the pylorus and duodenal sphincter should be avoided. Anastomosis should be done above the duodenal sphincter to protect the intestine from distention. The Billroth I method is preferable to other operations for resection.

In order to avoid useless or harmful operations upon the stomach or appendix more attention should be given to cæcum mobile, the dilated, kinked or mobile duodenum, the ileopyloric reflex, and the reflex from chronic thoracic disease.

MARCUS H. HOBART, M.D.

Schoemaker, J.: Some Technical Points in Abdominal Surgery. *Surg., Gynec. & Obst.*, 1921, xxxiii, 591.

The author gives a detailed account of the technique he employs in various operations. By the method described he is able to perform a resection of the large intestine without opening the lumen of the colon; the mucosa is neither seen nor touched. For spasm of the pyloric sphincter he does a hemisphincterectomy. The pylorus is grasped between

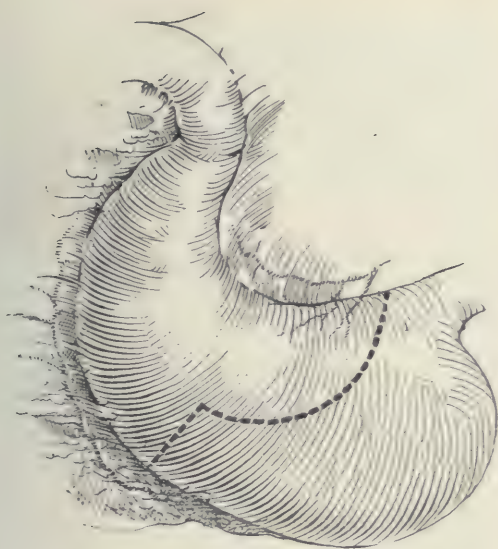


Fig. 1. Incision in resection of stomach.

the thumb and forefinger and an incision is made in the serosa. The muscle is freed, cut near the greater curvature, pulled out with a forceps, and again cut near the lesser curvature. The serosa is closed with three or four stitches. For resection of the stomach he uses the Billroth I method, employing an incision which permits the approximation of the stump to the duodenum without tension.

FREDERICK CHRISTOPHER, M.D.

Farish, G. W. T.: A Surgical Curiosity. *Canadian M. Ass. J.*, 1921, xi, 950.

The case reported was that of a woman, 33 years of age, who had been operated upon in September, 1919, for some uterine condition. Just what had been done was unknown.

She had been suffering excruciating abdominal pain associated with vomiting for twelve hours; the pulse was 96 and there was some tenderness over the abdomen which was most marked over McBurney's point. The symptoms had been masked by morphine. The diagnosis rested between appendicitis and obstruction of the intestines.

At operation the appendix appeared normal but the small intestine was red, distended, and oedematous. There were no adhesions. A lump found in the small intestine was removed. On examination this proved to be a gauze sponge measuring 11 by 30 in.

CARL R. STEINKE, M.D.

Smith, F. K.: The Diagnosis and Treatment of Perforated Duodenal Ulcer, Founded on Forty-One Consecutive Cases. *Brit. M. J.*, 1921, ii, 1068.

The author reports a study of forty-one consecutive cases of duodenal ulcer. The records show that

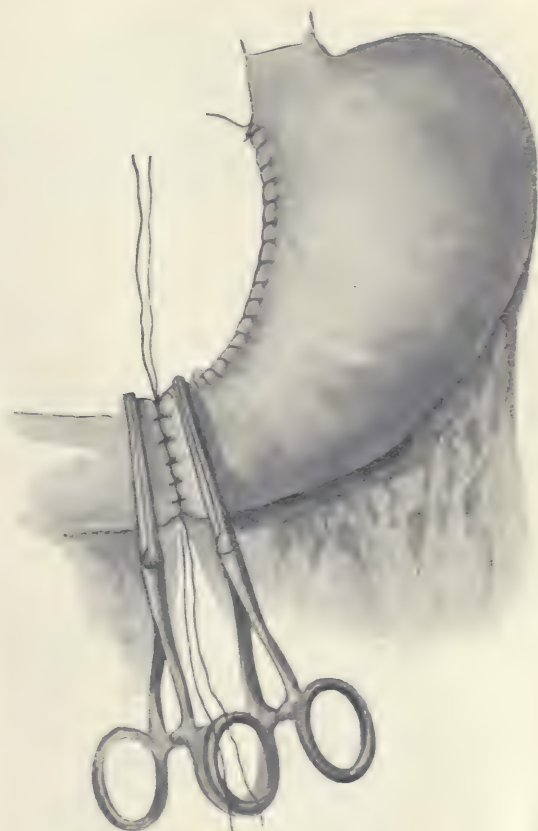


Fig. 2. Union between stomach and duodenum completed (*Some Technical Points in Abdominal Surgery—Schoemaker*).

in women the occurrence of duodenal ulcer is rare and perforation is still more uncommon, the ratio of men to women being 40 to 1. The youngest patient in the series was 17, the oldest 62 years. The previous history of ulcer and the period of exacerbation of symptoms previous to perforation varied from a few hours to a week.

Perforations are classified into three groups: (1) profuse, rapid, and diffuse; (2) profuse, more gradual, and more localized; and (3) small, gradual, and localized. Most of the author's cases belonged to the first two.

Smith describes the three classical stages: (1) sudden acute pain in the epigastrium, collapse, sub-normal temperature, rapid pulse; (2) a later period with few symptoms and fewer signs; and (3) acute peritonitis and rapid pulse with mounting temperature.

In making a differential diagnosis attention should be given to a history of indigestion, acute appendi-

citis, renal colic, etc. The prognosis depends upon the early recognition of the condition.

With regard to the treatment the author advises closure of the perforation by a pursestring suture and irrigation of the peritoneal cavity, with an outlet tube in the suprapubic wound, until the fluid comes away clear. After closure of the suprapubic wound the patient should be placed in the Fowler position.

M. R. FLYNN, M.D.

Bachlechner, K.: Inflammatory Ileocaecal Tumors (Ueber entzündliche Ileocoecaltumoren). *Beitr. z. klin. Chir.*, 1921, cxxiv, 103.

Bachlechner reports on four cases from the Braun clinic.

CASE 1. The illness had begun suddenly three months previously with abdominal pain. Since then, a tumor had slowly developed in the lower part of the abdomen on the right side. The neoplasm was tender on pressure and somewhat uneven. The diagnosis was tuberculosis or chronic appendicitis. Operation revealed a caecal tumor covered by omentum. This was resected and a lateral ileocolostomy was done. The patient recovered.

The specimen showed that the serosa and muscularis were greatly thickened. The mucosa was swollen but there was no ulceration. The sections showed only inflammatory processes. The condition of the appendix is not reported.

CASE 2. For several weeks the patient had had trouble in defecation and gas in the right side of the abdomen which was expelled with difficulty. In the lower part of the right side of the abdomen was a large tender mass extending from a finger's breadth below the spinal line to the border of the costal arch. At operation a tumor the size of a child's head, which was firmly attached to the posterior wall of the caecum, was removed and the bowel joined by lateral anastomosis. The ileum showed considerable hypertrophy. The operation resulted in a cure.

The specimen showed much induration and fatty formation. In the indurated caecal wall lay the appendix from which, fistula-like, pus-filled passages led into the thick fatty tissues of the surrounding parts.

CASE 3. The patient was a man 71 years of age who for eight days had suffered with partial retention of gas and stools. There had been no vomiting or fever. A diagnosis of strangulated hernia on the right side was made. An area of resistance the size of a fist and painful on pressure was found in the lower right abdomen near the inguinal canal. The inguinal canal was scarcely penetrable with the tip of the finger and very tender. A large hard tumor of the caecum was found. The tumor and the entire ascending colon were resected and the continuity of the bowel restored by side-to-side anastomosis. The patient recovered.

Pathologic examination showed induration of the connective tissue in the vicinity of the caecum which was apparently due to perforation of the appendix.

CASE 4. February 20, 1920, the patient had an attack of acute appendicitis. After six weeks of rest in bed and evacuation of pus through the rectum his condition improved, but two weeks later there was recurrence of the pain and vomiting. May 12, 1920, the caecum, which had been transformed into an indurated tumor, was removed and the bowel united by end-to-side anastomosis. A cure resulted.

The literature contains the reports of thirty-seven similar cases. The cause of all inflammatory tumors is continued irritation due to a bacterial focus or a foreign body (faecal stones were not found in Bachlechner's cases). Tumors of the type described in the vicinity of the caecum almost always develop insidiously and without characteristic symptoms because of their location in the insensitive abdominal region. The differential diagnosis from malignant tumors, tuberculosis, and actinomycosis of the bowels may be very difficult. Obstruction of the lymph, particularly in the submucosa, may favor the fibroplastic process. Since it is usually impossible to determine the character of the tumor with certainty in the course of operation, Bachlechner believes that ileocaecal resection is the only rational procedure.

MARWEDEL (Z).

Davis, C. B.: The Diagnosis and Treatment of Cancer of the Large Bowel. *Illinois M. J.*, 1921, xl, 441.

Davis states that early recognition of malignancy of the large intestine is unusual. This is due to the fact that the symptoms are obscure and resemble those of other conditions. Blood in the stools may not be noticed by the patient or may be diagnosed by him as due to piles. The obstructive phenomena are usually the cause of his seeking medical advice. Constipation with colicky pains or melena is suggestive. When once malignancy is suspected, it can usually be diagnosed by careful and repeated examinations of the stools, which as a rule show blood, and by fluoroscopic and X-ray examination. The fluoroscope is very valuable as it shows the permanent defects caused by cancer.

Cancer of the lower part of the rectum can be recognized by digital palpation or by sight through the proctoscope. Section for microscopic examination is advisable even though the tumor is typical.

The condition must be differentiated from acute and chronic diverticulitis, polyposis, and tuberculosis. Its differentiation from diverticulitis requires microscopic examination as even when the abdomen is opened the appearance of the two conditions is sometimes similar. In polyposis there may be blood in the stools and pain, but the proctoscope may reveal a polyp and the fluoroscope shows no filling defect. Tuberculosis is found more frequently near the ileocaecal region of the colon and less frequently as the anus is approached, while the reverse is true of cancer. Moreover, in tuberculosis of the colon other tuberculous foci are usually present in the body and the filling defect is of a different character.

The treatment is perhaps more hopeful than has been generally conceded as occasionally a very good result is obtained by wide dissection. Enlarged glands may be due to inflammatory reaction and hence do not necessarily preclude operation. A number of the author's patients in whom all glands examined showed malignancy lived more than five years after operation, and one who had involvement of the levator ani muscle is alive at the end of eight years.

End-to-end or side-to-side anastomosis is ideal. As the end-to-end anastomosis fails to unite in the rectum below the peritoneum, total resection of the rectum is indicated. The Kraske operation was formerly used, but an abdominal incision is now added. The patient's age, sex, and general condition, however, determine the procedure. The Kraske operation is best for stout persons. The advantages of the combined operation are a more radical removal of the disease and a better opportunity to determine operability and to make the proper type of artificial anus. If a long redundant loop of bowel is left, it will act as a reservoir.

MARCUS H. HOBART, M. D.

Erdman, S.: High Enterostomy for the Relief of Ileus Complicating Appendicitis. *Surg. Clin. N. Am.*, 1921, 1, 1663.

Erdman reports three cases in which high enterostomy was performed for the relief of ileus complicating appendicitis.

The first patient, a man aged 34, began to have steady colicky pain in the lower abdomen, with nausea, but no vomiting, on October 6, 1921. Later the pain became localized over the appendix. The bowels moved on the second and third days. On the third day dysuria supervened.

On October 10 the patient was admitted to the hospital with a temperature of 102 degrees F. The blood count showed 16,000 leucocytes and 88 per cent polynuclears. The right lower abdomen was rigid and there was marked rebound tenderness over the entire abdomen. A small mass was palpable in the region of the appendix.

Operation was performed at once, a completely gangrenous appendix surrounded by 2 oz. of pus with the odor of colon bacillus being removed. The peritoneum of the surrounding intestines was acutely inflamed. Two cigarette drains were inserted.

For two days following this operation the temperature remained elevated and the pulse became more rapid. Abdominal distention became constantly more marked and there was vomiting at frequent intervals despite repeated lavage of the stomach. On the seventh day of the illness and the third after operation a small amount of gas and feces was passed following a colon irrigation combined with the administration of pituitrin. The pulse on this day was 144 and the general condition was very grave.

A high enterostomy was then performed. The vomiting and distention were somewhat relieved

but death occurred eighteen hours later. No autopsy could be made.

The technique of high enterostomy as performed in this case was briefly as follows:

An oblique intermuscular incision was made in the left side of the abdomen just lateral to the left rectus and a little above the level of the umbilicus. Without trauma or unnecessary handling, a short loop of distended intestine was drawn out of the incision. On the convex surface a circular pursestring chromic suture was placed, the intestine opened with the thrust of a scalpel, a No. 20 French catheter rapidly introduced for 3 in., and the pursestring suture at once tied snugly. The end of the catheter had been previously cut off, and a lateral opening made in it near the tip. The tube was then depressed along the convex surface of the bowel so that it lay in a furrow, and the edges of the furrow were sutured together over the tube for a distance of $1\frac{1}{2}$ in. according to the Witzel method of gastrostomy. The intestine was then returned to the peritoneal cavity and sutured lightly to the peritoneum. The wound was not sutured but the tube was fastened to the skin edge with silk. A small rubber-dam drain was placed down to the peritoneum.

The second patient, a boy aged 8 years, was admitted to the hospital October 4, 1921, suffering from acute suppurative appendicitis with spreading peritonitis, the illness being then of four days' duration. He had had one similar attack four months before. On his admission to the hospital his temperature was 103 degrees F. and the blood count showed 16,000 leucocytes and 90 per cent polynuclears.

Operation was performed immediately, a suppurative appendix being removed. The appendix was surrounded by several ounces of purulent fluid (culture showed colon bacillus) and its tip lay to the left of the midline over the brim of the pelvis. As there was practically no walling off, a spreading peritonitis had developed. A rubber-dam Mikulicz drain was inserted and the wound left unsutured.

Following the operation the abdomen became distended and each day vomiting occurred several times. Colon irrigations and catharsis failed to obtain satisfactory returns. On the seventh day after the operation a pocket of pus, which had been felt through the rectum, was drained through the appendix wound and about 3 oz. of pus were evacuated from the depths of the pelvis. On the thirteenth day a high enterostomy was performed.

The vomiting never recurred after the operation and the distention was rapidly and markedly relieved. The boy was discharged from the hospital cured November 9, 1921.

The third patient, a male aged 60, was admitted to the hospital September 23, 1921, with symptoms of intestinal obstruction complicating a ruptured abscess of the appendix. For two weeks he had been sick in bed. The onset of the illness was characterized by general abdominal pain, nausea, and diarrhoea. After the first day the pain became localized in the right lower quadrant and remained there for

six days. Five days before the patient's admission to the hospital vomiting recurred. The vomitus was definitely faecal, and for thirty-six hours no gas or faeces had been passed.

Operation was performed immediately. No attempt was made to find the appendix which was not visible in the wound. A high enterostomy was performed according to the technique described in the first case.

For three days there was profuse drainage, averaging about 1,500 c. cm. per day. The tube was removed on the fourth day, after which there was scarcely any drainage as the valve action of the enterostomy opening came into play and the wound healed very promptly. The convalescence was rapid in spite of a faecal fistula in the appendix wound which discharged from the fourth to the seventeenth day. The patient was discharged October 18.

From this limited experience the author concludes that much more efficient drainage of the toxic intestinal contents can be obtained by a high enterostomy than by a low enterostomy.

The relief of vomiting and distention is greater after a jejunostomy than after a low ileostomy.

A high ileostomy can be performed rapidly, with a minimum of trauma, and under local anaesthesia, and should cause no appreciable shock.

The valve-like action of a properly performed jejunostomy results in automatic closure of the opening as soon as the tube is removed, and no secondary operation for closure is necessary.

After primary relief of obstruction the tube may be used for the introduction of fluids.

MARGARET I. MALONEY.

Packard, H.: Appendicular Lithiasis: Reports of a Case Unique in the Annals of Surgery. *Boston M. & S. J.*, 1921, clxxxv, 636.

The author reports a case of appendicitis in which operation disclosed a ragged hole in one side of the appendix through which protruded a large irregular stone with apparently the hardness of porcelain. No pus was encountered. The hole was apparently caused by pressure necrosis. The stone measured 4 by 2 by 1 cm. and on section was found to consist of inspissated faecal material and irregularly concentric deposits of amorphous bile salts.

FREDERICK CHRISTOPHER, M.D.

Mechling, C. C.: Tuberculoma of the Ischio-rectal Fossa. *Am. J. Surg.*, 1921, xxxv, 371.

Tuberculosis primary in the anorectal region is well known and may be present in the ischio-rectal fossa without evidence of the disease in other parts of the body. In most cases reported in the literature, however, there were ulcerative lesions, fistula, or miliary deposits which tended to break down and form tuberculous ulcers. In distinctly localized disease, complete excision together with extensive actino-radiotherapy seems to give the best prognosis, but the patient should be examined frequently after the operation.

Mechling reports a case of tuberculoma of the ischio-rectal fossa which caused pain and tenderness in the region of the rectum. A small round swelling developed about the anus and had continued to increase in size and tenderness for six weeks. Except for indigestion, constipation, weakness, and lassitude, the history was negative.

On physical examination a hard, round, tender, and cartilage-like mass the size of a hen's egg was felt in the ischio-rectal fossa. The growth suggested a lipoma with a tough capsule. It seemed to be attached to the ischium and did not feel or appear to be due to inflammation. The skin over it was movable. There were no haemorrhoids or mucous membrane lesions. The X-ray examination and the blood Wassermann test were negative.

Under novocaine anaesthesia the tumor was removed *en bloc* through a crescent-shaped incision between the anus and ischium. It contained thin pus. Pathologic examination showed it to be a tuberculoma. When the stitches were removed on the seventh day pus escaped. The wound was then treated according to the Carrel technique. Smears taken on the fifteenth and twenty-fourth days showed tubercle bacilli. The wound was healed by the fortieth day. Since his discharge from the hospital the patient has been in good health.

WALTER C. BURKET, M. D.

Dudley, G. S.: Ischio-rectal Abscess: Its Etiology, and a Method of Treatment to Avoid Fistula and Recurrence. *Am. J. Surg.*, 1921, xxxv, 365.

On the second surgical division at Bellevue Hospital during the past three years, 25 per cent of ninety cases of ischio-rectal abscess resulted in complete cures, i.e., normal bowel control and no sinus. Of the remaining cases, one was a case of epithelioma, one was fatal because of gas bacillus infection, two were cases of tuberculosis, two were complicated by diabetes mellitus, and in others there was a history of repeated operations in the treatment of the abscess. The usual sequence of events was: (1) operative incision of an ischio-rectal abscess, (2) the formation of a persistent sinus, and (3) recurrence of the abscess.

With regard to the relationship of ischio-rectal abscess to pulmonary tuberculosis Walsham cites 891 cases under treatment for three years in which there were only five cases of anal fistula and two cases of ischio-rectal abscess. In 133 autopsies only one anal fistula was found. Gant states that tuberculosis is present in from 4 to 6 per cent of cases of anal fistula. Dudley has noted that only a few abscesses and fistulae are proved tuberculous by histologic examination—not more than 2 per cent.

Except in cases of haematogenous origin, true ischio-rectal abscess is practically always secondary to a break in continuity of the anal mucosa. In the beginning the process may be considered as a blind internal anal fistula with abscess formation. Hard faeces or a sharp foreign body may lacerate the mucosa and open a path for infection of the poorly

resisting fatty tissue. Other less common causes are inflamed and thrombosed hæmorrhoids, rectal ulceration, polypi, and neoplasms. Debilitating illness, such as influenza and pneumonia are not uncommonly complicated by ischiorectal abscess.

The weakest point in the bowel wall is the small anal canal between the two sphincter muscles which is separated from the fatty tissue of the ischiorectal fossa only by tendinous insertions of longitudinal muscle fibers. This becomes more pronounced with age and prolonged straining during defæcation.

During the last three or four days before the patient seeks medical advice the ischiorectal abscess compresses the fat of the fossa, thus permitting union of the original injury to the mucosa. Consequently at operation the point of infection may be difficult to find.

The surgical treatment has two main objectives: first, to evacuate the pus and provide drainage; second, to determine the point of entrance of the infection. The author recommends: pre-operative castor oil catharsis, two soap-suds enemata in the evening of the day before operation, general anæsthesia with the patient in the lithotomy position, and thorough manual dilatation of the sphincter muscles by gradual stretching for five to ten minutes to permit inspection of the anal mucosa. A definite defect or locally inflamed indurated area on the mucosa is then seen. The abscess is incised by an ample radial incision. After retraction of the wound edges, a second search for the tract is made with the probe externally and a finger in the rectum. As frequently the probe will pass into the gut lumen, care must be taken not to make an artificial hole. The entire tract should be laid open by incision and division of the external sphincter to place the tissues at rest. Pus is taken for bacteriological study and a section of the abscess wall for histological examination. The wound is packed with petrolatum gauze.

Postoperatively the gauze is changed and the wound irrigated following the first bowel movement (usually the third day) and subsequently each day. The wound heals by granulation from the depths. Daily hot sitz baths are beneficial, hastening convalescence. If an internal opening was not found at operation, a search is made for it at the dressings with the probe externally and the finger in the gut lumen. If it is located, the patient is again anæsthetized, the tract is laid open, and the external sphincter is divided.

If the abscess were opened and drained simply by a skin incision, the cavity would contract to a small persistent sinus and recurring abscesses might form as the result of renewed infection from the rectum. An unusually large abscess or an abscess involving both ischiorectal fossæ may require a second operation for complete cure.

In Dudley's opinion Elting's method of dissecting back and resecting the diseased mucosa and suturing healthy mucosa to the anal mucocutaneous margin is as dangerous as the Whitehead method.

WALTER C. BURKET, M. D.

Pennington, J. R.: *A Classification of Rectal Fistulæ: The Treatment of Each Variety.* *Am. J. Surg.*, 1921, XXXV, 372.

In reviewing the development of the rectum and anus the author describes particularly the pectinate line with its sinuses, crypts, and columns of Morgagni which marks the junction between the rectum and anus and is the region at or near which the great majority of rectal diseases begin. The pectinate line and the rectal fascia he calls the "splanchnosomatic funnel." This, he believes, marks the division between visceral and perineal diseases.

Pennington classifies fistulæ according to the anatomical location of the inner opening as follows: anal (opening located in the anus); anorectal (opening located at the pectinate line); rectal (opening passes through the wall of the rectum proper); and rectosigmoid (opening penetrates the bowel wall at the rectosigmoid juncture). Other terms, such as "horseshoe," "watering pot," "multiple," etc., are merely expressions of complexity, multiplicity, position, or shape. Between 85 and 90 per cent of fistulæ are of the anorectal type.

Anal fistulæ require only incisions, and anorectal fistulæ, complete dissection and immediate suture. Rectal fistulæ may be treated by the author's seton method, and rectosigmoidal fistulæ, by the author's method of ligation.

The gravity of the condition depends upon the location of the inner fistulous opening. Rectal fistulæ are more serious than anal fistulæ. The number of external openings has little to do with the gravity of the condition.

In 6,296 cases reported the external opening was in the median line in 1,262 (in 154 behind the anus), and on the sides in 5,437 (129 more being on the left side than on the right).

The author calls attention to the prevention of fistula by early evacuation of the abscess followed by drainage and filling with bismuth paste every two, three, or four days.

WALTER C. BURKET, M.D.

Ruebsamen, W.: *New Operative Principles for the Treatment of Vestibular Anus* (Neue Operationsprinzipien bei Anus præternaturalis vestibularis). *Ztschr. f. Geburtsh. u. Gynaek.*, 1921, LXXXIV, 46.

By the term "vestibular anus" is meant a developmental anomaly of the external genitals in which the rectum empties into the urogenital sinus because the cloaca, into which the bladder, vagina, and gut empty in the early embryonic stage, is persistent. In some of these malformations there is a normal anus in addition to the abnormal opening.

If the opening of the gut is not insufficient, this malformation does not always cause symptoms even during pregnancy and labor. Such a case the author reports in detail. He describes also another case in which, in addition to a normally situated anus, there was an abnormal opening of the gut in the vagina which was surrounded by only rudimentary

sphincteric muscles and necessitated surgical treatment.

The operation was done under local anæsthesia. As the vaginal fistula was markedly altered by cicatrices from a previous operation, the incision was made around it at a distance of $\frac{1}{2}$ cm. The edges of the wound were well mobilized and closed with a mattress suture. The line of suture was invaginated toward the rectum in a transverse direction by means of double catgut. The fistula was then further mobilized proximally so that it could be drawn out with the rectum, a transverse incision 3 cm. long was made in front of the anus, and the sphincter ani muscle, which was normally developed, was exposed anteriorly and separated for a distance of $1\frac{1}{2}$ cm. from its adhesions to the rectal wall. By piercing the intervening tissue, the lower wound region was connected with the upper wound region, and by drawing the sutures outward under the sphincter the sutured fistula was attached externally below the sphincter. The sphincter was then sutured to the gut proximally to the sutured site of the fistula, and the sutures with which the fistula was coapted were passed to the inner surface of the anal skin and tied. In the final step the vaginal wound edges were resected, the wound was closed after suture of the levators with buried catgut sutures, and the closing suture was placed in the transverse perineal wound. Complete continence resulted.

In conclusion Ruebsamen cites the results in four cases reported by other authors. Under certain conditions a vulvovestibular anus may cause serious disturbances during pregnancy, in labor, and in the puerperium, especially when pelvic anomalies are associated with it. If the described operative procedure is to be used for cases with an associated atresia of the anus, it must be supplemented by an additional procedure in which an anal opening is made in the lumen of the sphincter found at the normal location. The closure of the abnormal anus and partial proximal displacement of the sphincter should then be done in the manner described.

BODE (Z).

Gant, S. G.: The Relation of Pulmonary and Ano-Rectal Tuberculosis to Fistula in Ano. *Am. J. Surg.*, 1921, xxxv, 368.

Of 5,000 fistulæ treated by Gant, only 10 per cent were tuberculous. The records of institutions for the treatment of pulmonary tuberculosis show that from 1 to 30 per cent of patients with that condition have fistula in ano but after a study of statistics from several sanatoria and his own cases, the author concludes that 5 per cent is more nearly correct. Only a small percentage of anal fistulæ are tuberculous. Ninety-seven per cent of tuberculous and anorectal ulcers and fistulæ are due to tubercle bacilli of the human type and 2 per cent to those of the bovine type. Five per cent are primary and 95 per cent are secondary to tuberculosis in some other structure, usually the lungs. Tuberculosis elsewhere in the body may be secondary to anorectal tubercu-

lous ulceration and fistula, especially following operation.

The author classifies anorectal fistulæ according to their healing time and relation to tuberculosis as follows: (1) ordinary fistulæ in cases of pulmonary tuberculosis, which usually heal rapidly after operation; (2) tuberculous fistulæ in otherwise healthy subjects; in these cases it is unsafe to give an opinion as to the time required to effect a cure; and (3) tuberculous fistulæ in cases of pulmonary tuberculosis (double infection may so devitalize the patient that neither condition will heal).

The early symptoms of tuberculous fistula uncomplicated by lung involvement are a discharge, rectal discomfort, and irritation of the peri-anal mucosa and skin for a long period of time. As a rule cases of pulmonary tuberculosis with tuberculous fistula in ano have the usual symptoms and signs of pulmonary tuberculosis. Some patients, however, have no symptoms suggesting tuberculosis, and the character of the fistula is discovered only when the tubercle bacilli are found in the discharge. The fistulæ are seldom painful or sensitive to the touch.

The final diagnosis depends upon the finding of the tubercle bacilli in the discharge, the scrapings from the tract, or sections of the fistula wall. It must be remembered, however, that tubercle bacilli are found in the anal region in cases of pulmonary tuberculosis. The smegma bacillus must be ruled out.

The findings upon which the differential diagnosis between ordinary fistula and tuberculous fistula is based are summarized as follows:

ORDINARY FISTULA	TUBERCULOUS FISTULA
Internal and external openings small, round, and situated in the center of an elevation	Openings large, irregular, and with undermined purplish edges
Buttocks plump	Buttocks emaciated
Hairs of peri-anal region normal	Hairs abundant, long, and silky
No cachexia	Cachexia
Face, ears, and nose unchanged	Face pinched, nostrils dilated
Voice natural	Voice husky
No loss in weight	Marked emaciation
Discharge slight, thick, and yellow	Discharge thin, profuse, and whitish
Probing difficult	Probing easy
Appetite normal	Appetite poor
Digestion good	Indigestion
No night sweats	Exhausting night sweats
	Sleep disturbed
No lung involvement	Pulmonary lesion with or without hæmorrhages
Discharge contains colon bacilli, streptococci, or staphylococci	Discharge contains tubercle bacilli
Tight sphincter	Patulous anus
Temperature normal	Afternoon rise of temperature

The prognosis is fairly good for ordinary fistula in tuberculous subjects with vitality, and for tuberculous fistula in persons otherwise healthy although

healing is slow. Occasionally primary and secondary tuberculous fistulæ and ordinary sinuses in phthisical subjects are not healed by palliative or operative measures and the patient dies of phthisis or exhaustion due to local lesions. Many apparently otherwise healthy persons have latent tuberculous foci in the lungs and die shortly after operative treatment of the fistula, probably because of lighting up of the tuberculous process by the ether or other general anæsthetic.

Palliative measures give comfort and strengthen the patient for the operation. These consist of enlarging the fistulous openings, cleansing and draining the sinus, stimulating the ulcers, the use of salves, suppositories, or dusting powders to relieve the pain and allay the irritation of the anal mucosa and skin, and the general measures usually employed in the treatment of tuberculosis.

Operability is determined by the patient's vitality. In some cases a cure has been obtained by operation on the fistula followed by mountain life. Anorectal sinuses and the majority of ordinary fistulæ in tuberculous subjects are readily operated upon under local anæsthesia. Rarely, deep and complicating fistulæ requiring general anæsthesia are divided under anæsthesia induced with gas or chloroform but never with ether as the latter aggravates the pulmonary lesion. The author recommends infiltrating the bridge overlying the fistulous tract with $\frac{1}{2}$ per cent eucaine. After division of the sinus, the removal of overhanging edges with the knife, scissors, or cautery, the wound is treated with phenol or cauterized to prevent extension by any injured lymph or blood vessels, and packed with gauze to prevent bleeding.

After the operation special stress is placed upon general measures used in the treatment of tuberculosis.

Gant prefers operative division to excision of tuberculous fistulæ. The ligature operation has been abandoned since local anæsthesia has been used.

WALTER C. BURKET, M. D.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Walters, W.: Pre-Operative Preparation of Patients with Obstructive Jaundice. *Surg., Gynec. & Obst.*, 1921, xxxiii, 651.

A study was made of cases in which death occurred after operation for obstructive jaundice in the Mayo Clinic during 1918, 1919, and 1920, with a view to determining the cause of death and its relation to the degree of jaundice and the coagulation time of the venous blood.

More than one-half of the deaths following operations upon jaundiced patients were due to hæmorrhage, while in the cases of unjaundiced patients death from hæmorrhage was exceedingly rare although the operation was similar. Thus it would seem that death from hæmorrhage in such cases is dependent on a coagulation time of more than ten

minutes and a marked degree of jaundice. The hæmorrhage seems to be due to a continual oozing from traumatized surfaces rather than bleeding from several arteries.

In view of the work of King, Bigelow, and Pearce, the belief seems justified that calcium offers the best means of preparing jaundiced patients for operation as it reduces not only the coagulation time of the blood, but also the toxicity produced by the circulating bile pigments. Lee and Vincent have suggested the intravenous use of calcium. From 5 to 10 c. cm. of a 10 per cent solution of calcium chloride in redistilled water, which was given each of four patients with obstructive jaundice who had an abnormally high blood coagulation time, lowered the coagulation time to normal after three injections on successive days. In addition, these patients were given calcium lactate by mouth in doses of 100 gr. daily.

Mann has been able to keep dogs alive for from twenty to thirty-four hours after the removal of the liver by intravenous, subcutaneous, and intraduodenal injections of glucose. In view of this work, jaundiced patients in the Mayo Clinic have been fed large quantities of carbohydrates and the amount of glucose has been increased by Murphy drip proctoclysis of a 15 per cent glucose solution in tap water, one hour on and one hour off. Four thousand cubic centimeters of water are given by mouth every twenty-four hours to increase the body fluids and to aid in the elimination of bile pigments. If the patient does not respond to this regime, transfusion of blood is indicated twenty-four to forty-eight hours before operation.

In operations for obstructive jaundice the various steps of the operation should be carried out with the utmost gentleness, care being taken not to traumatize the tissues, especially those of the liver. For this reason cholecystectomy should not be performed at the primary operation if it can be avoided.

Langley, G. J.: The Difficulties in the Diagnosis and Treatment of Hepatic Abscess. *Brit. M. J.*, 1921, ii, 1073.

Hepatic abscess has assumed new interest among British physicians because of its relative high frequency following over-seas service, the difficulties of accurate diagnosis, and the striking results of emetine treatment. Surgical treatment of liver abscess may be followed by recurrence as in the following cases:

The first case was that of a man, aged 43, who contracted dysentery in Palestine in 1918. A large liver abscess was opened and drained. Two years later he was admitted to a hospital with intense hepatic colic and a markedly enlarged liver. X-ray examination showed fluid at the right base and a fixed diaphragm. Under treatment, the diaphragm and liver returned to normal. About one year later an acute liver abscess developed, from which over 2 pints of pus were evacuated. He made a good recovery.

The second case was somewhat similar except that all the symptoms and signs of an acute hepatic abscess disappeared under emetine treatment and the patient has since remained well.

The syndrome of dysentery, pyrexia, leucocytosis, and hepatic pain and enlargement is generally diagnosed as hepatic abscess, but it is important to bear in mind the fact that although the right dome of the diaphragm may be pushed up and fixed, the pathologic condition may be acute amoebic hepatitis. This is the early stage of the disease, in which errors of diagnosis are frequent and emetine effects a cure. It is usually impossible to differentiate hepatitis from abscess unless there is an actual bulging. Emetine treatment consisting of 1 gr. of the hydrochloride given hypodermically night and morning may obviate much unnecessary surgery. The rapid diminution in the size of the liver can be observed roentgenographically, and in the course of one or two weeks the patient's condition is comparatively normal, without pain or fever.

The temperature curve in the early stages of the disease resembles very closely that of an enteric infection, but speedily returns to normal under emetine treatment.

Two forms of dysentery are frequently noted in amoebic infections. In one, diarrhoea occurs at night, the bowel acting three or four times, while in the other there are two or three loose evacuations in the morning between breakfast and luncheon followed by intestinal quiet for the rest of the day. This condition is frequently neglected until hepatic infection occurs. The author cites an illustrative case and a case of amoebic abscess in the lesser peritoneal cavity in which recovery followed surgical intervention combined with emetine treatment. Two cases of hydatid cyst of the liver are reported to illustrate points in the differential diagnosis.

V. G. BURDEN, M. D.

Judd, E. S.: Surgery of the Gall-Bladder and Biliary Ducts. *Canadian M. Ass. J.*, 1921, xi, 939.

In cases of infection of the gall-bladder and bile ducts early operation is usually followed by good results. The onset of jaundice or the extension of infections to the pancreas increases the severity of the condition.

Recent experimental work by Mann has shown that total hepatectomy in the dog is followed by death within a few hours, but if glucose is introduced into the blood stream, immediate resuscitation occurs and life may be prolonged for many hours. It is not known whether the condition which occurs during jaundice is due to toxæmia, disturbance of liver function, or the influence of bile in the blood. Bell's studies on biliary cirrhosis have demonstrated the regenerative powers of the liver when the gall-bladder is anastomosed to the intestine after total occlusion of the common bile duct. This work suggests the possibility of some temporary substitute for liver function which will favor complete recovery.

Chronic pancreatitis with associated cholecystitis is best relieved by cholecystectomy. Acute pancreatitis should be treated in the most conservative manner.

The route of infection is probably by way of the blood stream and lymphatic vessels. There is little clinical evidence to indicate duct-borne infection. Cholecystitis and hepatitis are frequently associated, and infection gaining entrance by the portal circulation may pass to the gall-bladder by means of communicating lymphatics between the gall-bladder and liver. In the associated lesions pancreatitis is secondary to cholecystitis and the infection may extend from the gall-bladder to the pancreas by way of the lymphatics. Lesions in the liver and pancreas frequently coexist with inflammation in the stomach, appendix, or duodenum. In these cases the infection probably originates in the appendix and extends to the gall-bladder and duodenum by way of the lymphatics.

Mann has produced specific cholecystitis in the dog by injecting chlorinated soda intravenously; the solution gained entrance to the tissues of the gall-bladder through the blood stream. Therefore any material in the blood may become lodged in the tissues of the gall-bladder.

The recurrence of symptoms after operations on the gall-bladder may be due to the formation of stone or to retained infection. In some instances hepatitis and pancreatitis are the causes and, as a rule, gradually disappear. Sometimes the remaining symptoms are due to an ulcer or an inflamed appendix which should have received attention at the original operation.

In a small group of cases at the Mayo Clinic in which cholecystectomy had been performed for cholecystitis, complete relief of symptoms lasted for from six months to six years. Recurrence of typical hepatic colic then followed, in some instances with slight jaundice. At a second operation no lesion was found except a slight degree of hepatitis or pancreatitis. Drainage of bile was established by placing a small tube in the duct, and the patients were apparently permanently relieved. These cases probably represent exacerbations of hepatitis, pancreatitis, or both which existed at the time of the original operation. Marked changes in the function of the liver and pancreas may occur without gross changes in these viscera. It is probable that recurrence of symptoms is not caused by the absence of the gall-bladder because so few patients have such symptoms after cholecystectomy. The question arises as to whether these patients should have had common duct drainage at the primary operation.

The types of cholecystitis may be grouped clinically as follows:

Type 1 is disease of the gall-bladder characterized by typical hepatic colic. The acute pain is followed by residual soreness in the gall-bladder region and remission of all symptoms until another attack. The attacks may recur for several years and gradually produce intermediate symptoms referable to the

digestive tract, thus developing into cases of gall-bladder dyspepsia.

Type 2 is the so-called gall-bladder dyspepsia which may or may not be preceded by intermittent hepatic colic. In the absence of a history of typical attacks, the diagnosis is difficult. Infection of the appendix or gall-bladder may be the cause of dyspepsia, but in the absence of local symptoms the diagnosis of secondary dyspepsia is hazardous. The dyspepsia of ulcer has a characteristic and definite sequence of symptoms, relief obtained by food or alcoholics, and periodicity of pain. In cases of gall-bladder disease the symptoms are aggravated or are not affected by food. Pain is often constant through the day but rarely gives trouble at night. Although the roentgenogram is efficient in the recognition of ulcers of the stomach or duodenum, it is of little value in the diagnosis of diseases of the gall-bladder, even when stones are present. The method of diagnosing lesions of the biliary tract by study of the bile obtained after the introduction of magnesium sulphate into the duodenum through a Rehfuess tube has not proved of great importance in the hands of Hartman at the Mayo Clinic. The condition of the bile does not always reveal the conditions in the biliary tract.

Type 3 is infection which is retained in the gall-bladder over a long period and acts as a focus for more or less general infection. The diagnosis is difficult to establish. It is essential that there be some local evidence of disease before treatment is considered.

Type 4 is disease of the gall-bladder associated with migraine. At present the relationship cannot be explained, but treatment of the gall-bladder permanently relieves the migraine. It is possible that relief might have been obtained by any sort of operation as is often the case in epilepsy.

Type 5 is disease of the gall-bladder associated with changes in the cardiovascular system, such as endocarditis, myocarditis, or coronary sclerosis. In the treatment the best compensation possible for the cardiac condition should be obtained and an operation on the infected gall-bladder then performed.

Most cases of cholecystitis and cholangitis are surgical. In chronic cases operation may be done at the most convenient time. In acute attacks accompanied by jaundice it is usually best to wait until the attack has subsided, always keeping in mind, however, the possibility of rupture of the gall-bladder or extension to the pancreas. If a severe degree of pancreatitis is suspected, immediate operation offers the best chance for recovery. In cases of acute pancreatitis and necrosis, operation must be performed with the least amount of trauma, and usually should consist of drainage of the gall-bladder and the placing of several small drains to the capsule of the pancreas. A secondary operation may be necessary.

The presence of jaundice presents a serious complication; if possible, operation at this time should

be avoided. Operation on patients with beginning jaundice is comparatively safe, but in cases of well-established jaundice the risk is high. When jaundice is decreasing, operation should be deferred until it has reached its minimum. The great danger is hæmorrhage from the cut surfaces or the mucous membrane. The coagulation time and calcium time are not always safe indexes to the tendency to bleed. Immediate operation is demanded even in the presence of jaundice when the common duct is completely obstructed. In these cases pre-operative preparation to lessen the liability to postoperative bleeding should include blood transfusion and the intravenous administration of calcium. Transfusion after operation is also of value.

Complete occlusion of the common duct is a serious embarrassment to liver function. Urea metabolism, bile secretion, the formation of glycogen, and the detoxicating power of the liver are all or in part destroyed and a state of cholæmia ensues. Transfusion of whole blood is at present known to be a beneficial procedure. When bile ceases to drain satisfactorily after drainage has been instituted serious trouble is apt to follow. In such cases transfusion of whole blood frequently reestablishes and sustains the flow.

V. G. BURDEN, M. D.

Magoun, J. A. H., Jr., and Renshaw, K.: Malignant Neoplasia in the Gall-Bladder. *Ann. Surg.*, 1921, lxxiv, 700.

The authors report their studies on a series of eighty-four cases of malignant neoplasia of the gall-bladder collected from 7,878 operations for gall-stones in the Mayo Clinic between January, 1907, and January, 1921.

Males and females were afflicted in the ratio of about one to four. Seventy-five per cent of the patients were between the ages of 50 and 70 years.

Carcinoma is the most common type of malignant neoplasm of the gall-bladder. Sarcoma is exceedingly rare. In a large number of cases gall-stones were present. Early cholecystectomy for stones will either prevent the development of malignancy or reveal the condition in its incipency.

Twenty-nine of the thirty-eight patients on whom cholecystectomies were performed had had symptoms referable to the gall-bladder for more than one year; nine had had symptoms for less than one year.

If the condition is operable, cholecystectomy should be performed. Cholecystostomy should be done only when there is a severe infection of the gall-bladder or when a path must be formed for the introduction of radium (W. J. Mayo). As cholecystostomy for stones had been performed elsewhere in five of the eighty-four cases, it is evident that malignancy may develop in gall-bladders that have been drained.

W. J. Mayo considers jaundice a contra-indication to operation when a definite diagnosis of malignancy of the gall-bladder has been made.

Complications may be due to perforation of the gall-bladder, empyema, or extension to a neighboring viscus by continuity, contiguity, or metastasis.

Of the patients on whom cholecystectomies had been performed, seven (8.3 per cent) were alive six years after the operation. The diagnosis in these cases was gall-stones in three, gall-bladder disease in three, and gastric carcinoma in one. In the last case adhesions had developed between the gall-bladder and the pylorus. The operative procedure was cholecystectomy in five, cholecystectomy, excision of adjacent liver tissue, and choledochotomy in one, and cholecystectomy and gastro-enterostomy in one.

Amberger: Radical Operation for Carcinoma of the Common Bile Duct (Radikal operiertes Carcinom des Ductus choledochus). *Arch. f. klin. Chir.*, 1921, cxvii, 189.

This article reports a case of carcinoma of the common bile duct operated upon successfully. According to the author, only two other cases, those of Kehr and Doberauer, are known. Amberger's case was operated upon radically one and one-half years ago. The patient, a man 52 years old, was admitted to the medical division of a hospital April, 13, 1919, after having suffered with a gastric disturbance for two months. Previously he had always been well. The gastric symptoms (pain, nausea, and anorexia) had gradually decreased but were followed by a severe grade of icterus and tenderness of the gall-bladder. When the patient was placed on a meat-free diet occult blood was repeatedly demonstrated in the stools. The gall-bladder was distinctly palpable.

After observation for two months, the patient was admitted to the surgical division. He was then very much emaciated and had marked icterus and pruritus. He was operated upon June 15, 1919 after a four-day preparation with calcium chloride and digipuratum. The diagnosis was "closure of the common bile duct, probably of malignant nature."

At operation an incision was made at the costal border and adhesions were broken up. The gall-bladder was found to be enlarged and puncture showed white bile. At the juncture of the common bile duct and the cystic duct and surrounding the bile duct was a hard tumor the size of a cherry. The hepatic duct was about as thick as the small intestine, but the caliber of the efferent bile duct was normal. The tumor was removed. The defect between the hepatic and common bile ducts measured about 4 cm. The stumps could be approximated but circular suture was impossible because of the great difference in their size. Therefore a T-tube was inserted and a partial suture was done, chiefly on the posterior wall. A safety drainage tube was then laid beside the T-tube and the abdomen closed.

The postoperative course was smooth. Colored stools appeared on the fourth day. The T-tube was removed after three weeks, and the tampons and other drainage materials were removed twelve days

after the operation. The patient left the clinic January 9, 1920, free of symptoms. He has now been well for over a year and has been able to follow his occupation. An attack of icterus since the operation, lasting for three days, and several slight attacks during the last half year which did not disturb his general health the author attributes to slight stenosis.

The pathologic diagnosis made at the Senckenberg Pathological Institute was infiltrating adenocarcinoma. At operation the neoplasm appeared to be a primary tumor.

The author believes that the primary circular anastomosis of the hepatic and common bile ducts is the ideal operation. This, however, is applicable only rarely. When it is impossible he recommends the method he selected, that is, partial suture and the use of the T-tube as has been done by Jenkel, Verhogen, Wilms, Propping, and Doberauer.

GLASS (Z).

Lund, F. B: Surgical Treatment of Acute and Chronic Pancreatitis. *Boston M. & S. J.*, 1921, clxxxv, 771.

In pancreatic disease the indications for surgical intervention may be acute and imperative, as in acute hæmorrhagic pancreatitis, or may be for the prevention of invalidism from chronic pancreatitis or the alleviation of certain of the symptoms of an inevitably progressive disease, such as the jaundice associated with cancer of the pancreas. It has been found that only an exceptional arrangement of the common and pancreatic ducts would allow bile blocked by a stone to enter the duct of Wirsung. Not infrequently, this duct and the pancreatic ducts open by two separate openings close to each other in the papilla and such blocking is rendered impossible. Neither can it be produced when, as is sometimes the case, the duct of Santorini is the chief drainage canal of the pancreas, as a free anastomosis between the two ducts then enables either of them to take on the chief drainage function. Gall-stone disease, cholecystitis, adherent ulcer of the posterior surface of the stomach, and even retroperitoneal infection from appendicitis are often accompanied by chronic swelling and inflammation of the pancreas.

As our knowledge of gall-bladder disease has increased we have come to believe that the primary infection causing the cholecystitis and stones takes place, not by the passage of infected bile up the cystic duct into the gall-bladder, but through the lymphatics or blood vessels from the liver. Cases of both acute and chronic pancreatitis can be explained by a theory of the invasion of the pancreatic lymphatics from the inflamed gall-bladder, stomach, or retroperitoneal tissue.

Such a theory would suggest for the treatment of chronic pancreatitis, not drainage of the infected bile through a cholecystostomy, which at best is temporary, but the removal of the source of infection by a cholecystectomy. The author has obtained several recoveries from chronic pancreatitis following drainage of the bile ducts by cholecyst-

enterostomy. The gall-bladder should never be removed for pancreatitis unless it is known definitely that there are no stones in the common duct. A fact indicating the direct dependence of pancreatitis upon infection extending from the gall-bladder is that localized abscesses of the head of the pancreas, with fat necrosis, have been found several times by the author in operating upon a gall-bladder when operation was delayed for several days. The possibility of the development of pancreatitis is therefore an argument against delay in acute conditions of the gall-bladder.

J. D. ELLIS, M.D.

MISCELLANEOUS

Litchfield, H. R., and Dembo, L. H.: Acute Abdominal Conditions in Children: An Analysis of Two Hundred Cases. *Arch. Pediat.*, 1921, xxxviii, 747.

Of the 200 cases reviewed, 124 were cases of appendicitis. In fifty-nine the appendix had ruptured and peritonitis had developed; in thirty-one there was acute congestion; in fifteen, an abscess; in eleven, acute suppuration; and in eight, inflammation of the chronic type. Seventy-six of the patients were males and forty-eight were females. Their ages ranged from two weeks to 12 years. The average age was 8 years. The onset of the condition was sudden in 102 cases and gradual in twenty-two cases. Abdominal tenderness was present in ninety-six, and rigidity in eighty-eight. Only sixteen presented the triad of rigidity, localized tenderness, and distention. The lowest leucocyte count was 11,800, the highest 30,000, and the average 16,000. Operation was performed in 105 cases. Of the nine-

teen patients not operated upon, twelve were too ill, six refused operation, and one recovered under medical treatment. Peritonitis complicated sixty-three cases, bronchopneumonia three, and renal conditions nine. The mortality was 25 per cent, the vast majority of deaths being those of patients with complications. Two case histories are given.

There were eleven cases of intussusception. The youngest patient was eight months old and the oldest nine years. Eight were males and three were females. The onset was sudden and the clinical picture was characteristic in practically every case. As a rule the lesion was at the ileocecal juncture.

Twelve cases of tuberculous peritonitis with acute abdominal symptoms were studied, eight those of females and four those of males. Only two of the patients were white children. The von Pirquet test was positive in ten cases. The average leucocyte count was 9,000. General adenopathy was noted in ten cases.

The remaining fifty-three cases included cases of acute indigestion, ileocolitis, typhoid perforation, strangulated hernia, respiratory infections with acute abdominal symptoms and one case of renal sarcoma.

The article is summarized as follows:

1. Appendicitis is one of the most common of the acute abdominal conditions occurring in childhood.
2. Acute gastro-intestinal disturbances are apt to simulate the "surgical abdomen."
3. The symptoms and signs of the acute abdomen in the child do not always conform to those of any one condition.
4. Mistakes are often made in the diagnosis because the examining physician looks for characteristic clinical features and is misled by an atypical syndrome.

CARL R. STEINKE, M.D.

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Vander Veer, E. A., and Dickinson, A. M.: Fragilitas Ossium. *Ann. Surg.*, 1921, lxxiv, 629.

Fragilitas ossium is characterized by fragility of the bones and blue sclerae.

No etiologic theory has been proven. Syphilis was considered the cause but is no longer so regarded. Heredity plays an important part. In 9 or 10 per cent of cases there is a definite family tendency.

Ossification of the cartilage is delayed or absent, and very little dense bone is formed. The activity of the osteoblasts is subnormal, and the deposit of calcium salts and other mineral matter is deficient.

Fractures may occur in prenatal life. As a rule in such cases the bones of the head are fractured. Most infants suffering prenatal fractures are born dead or die soon after birth. The earlier fracture occurs in those living, the greater the number of fractures. The liability to fracture may decrease with age. The long bones are chiefly affected, especially the femurs.

In the case reported by the author the teeth were almost translucent.

Medication is of no avail. Many glandular and bone marrow preparations and tonics have proven useless. The treatment is merely symptomatic.

JOHN MITCHELL, M.D.

McWilliams, C. A.: Central Bone Abscess. *Ann. Surg.*, 1921, lxxiv, 568.

Central bone abscess is none other than the disease known and described many years ago by Brodie and called "Brodie's disease" or chronic suppurative osteomyelitis. Briefly outlined, the pathology of the condition in its simplest form is a small well-localized, circumscribed, pyogenic abscess situated deep in the medullary cavity or cancellous tissue of a long bone, without any external fistula or sequestration, and characterized frequently by an extensive productive osteitis often of many years' standing.

McWilliams quotes several recent authors as stating that central bone abscess or Brodie's abscess is a tuberculous infection of the bone. While it is

generally believed that Brodie attributed these bone abscesses to tuberculosis, there is no such suggestion to be found in the appended quotation given by Mc Williams from Sir Benjamin Brodie's publication of 1850. In McWilliam's opinion the condition is due to pyogenic organisms, usually staphylococci. The abscess must be differentiated from a bone cyst or tumor, syphilitic osteitis and periostitis, and bone tuberculosis.

Brodie's abscess is most commonly found in adults. As a rule there is a history of osteomyelitis in childhood which is almost forgotten. Following an injury or severe bodily exertion, or even without any recognized cause, a dull ache develops in a localized area. Gradually this becomes boring and severe and much worse at night. The pain is intermittent.

The most frequent locations of Brodie abscesses are the head of the humerus, femur, and tibia, and the shafts of the humerus, radius, femur, and tibia. The X-ray shows overdevelopment of dense bone in both the cancellous and medullary portion which usually produces a swelling. In the medullary type of the condition a central translucent area (the abscess itself) may or may not be observed in the center of the dense bone. The presence of a translucent area at once makes the diagnosis evident.

The author reports a number of characteristic cases of the disease. His conclusions are as follows:

A tender swelling of a bone associated with intermittent night pains which is not due to traumatic periostitis or syphilis and is not a cyst or new growth should always be explored. The medullary cavity should be opened and the soft parts should then be closed over it except for sufficient space to allow the insertion of Carrel tubes. Dakin's solution should then be used through the tubes every two hours until smears show an absence of organisms. When the cavity can be completely closed with confidence that the wound will heal promptly without the formation of a sinus.

F. W. CARRUTHERS, M. D.

Arnold, E. H.: Hæmorrhagic Osteomyelitis.
Boston M. & S. J., 1921, clxxxv, 717.

Hæmorrhagic osteomyelitis is regarded as a rare condition possibly because it is often unrecognized. It occurs in childhood and youth and usually attacks spongy bone.

A cavity is formed in the spongy part of the bone and becomes progressively more regular in outline. It is filled with a dark brown, jellylike mass oozing uncoagulated blood, and is lined by a brownish-red membrane which is fairly dense, friable, and about $\frac{3}{8}$ in. thick. It continues to expand but rarely ruptures unless there is a spontaneous fracture. When this occurs there is a regular, smooth swelling but no other signs of inflammation until the condition progresses. Microscopic examination reveals a hæmorrhagic extravasation with young fibroblastic tissue and many giant cells of the foreign-body type due to the presence of hæmorrhagic granular tissue. The fibroblasts form collagen fibrils which cause formation.

Subjective symptoms may be absent. In other cases pain may be due to joint movement or muscular contraction. Objective signs may be undetected until demonstrated by the X-ray or by fracture at the site of the lesion. There is usually neither heat nor redness. The superficial veins over the swelling may be enlarged because of pressure. Occasionally the patient limps. Slight atrophy of the adjacent soft parts occurs only in the later stages of the disease. If the condition is situated near a joint, there is some limitation of motion but this is painless. There is very little or no muscle spasm.

The diagnosis is based on the patient's youth, the location of the disease in spongy bone, a history of trauma, the absence of severe pain, limitation of motion and muscle spasm, long duration without exacerbations or metastasis, and the X-ray findings.

The condition must be differentiated from a malignant bone tumor and bone tuberculosis. All three occur early in life and tuberculosis and sarcoma may have the same location. Also in all three there may be a history of trauma. Unlike tuberculosis and sarcoma, however, hæmorrhagic osteomyelitis is painless and does not cause the limitation of motion, swelling, local heat, and muscle atrophy noted in tuberculosis or sarcoma near joints. Hæmorrhagic osteomyelitis may be stationary for years, while tuberculosis and sarcoma continue to progress. Roentgenograms of cases of tuberculosis do not reveal a cavity, and in sarcoma the cavity does not have the regular shape and smooth outline of the cavity of hæmorrhagic osteomyelitis. Sarcoma involves bone cortex and may break through.

The treatment of hæmorrhagic osteomyelitis consists of complete curettage of the hæmorrhagic membrane and of the whole cavity and recesses. The cavity may be filled in with bone chips of healthy cortex, the periosteum sutured, and the skin closed without drainage. A splint should be applied if there is a large cavity with a thin cortex, and the supporting brace should be worn until the X-ray demonstrates sufficient new bone formation to permit function. The prognosis is generally good.

RUDOLPH S. REICH, M.D.

Geist, E. S.: Osteomyelitis of the Pelvic Bones.
J. Am. M. Ass., 1921, lxxvii, 1939.

Bergman compiled thirty-five cases of osteomyelitis of the pelvic bones from the literature. In eleven, healing resulted, eighteen were fatal, and in six the result was unknown. Bergman reported also a case of his own in which a radical operation was performed with good results.

The author reports six cases, five of which were those of children. In three, the ilium was involved; in two, the ischium; and in one, the pubis. All reacted promptly to wide opening, free drainage, and the removal of sequestra. In every instance the roentgen-ray findings were positive and of great diagnostic aid. The infection was due to the staphylococcus pyogenes aureus. All cases presented a definite leucocytosis from 12,000 to 20,000.

In cases in which the ilium was involved the diagnosis was based on the history, the character of the pain, and a positive roentgen-ray examination. At operation pus was always discovered on the visceral side, displacing the peritoneum, and the amount of sequestrum was small. In one of the cases of involvement of the ischium a sinus near the anus was discharging pus and the condition had been diagnosed previously as osteomyelitis of the femur. The X-ray findings combined with the general history made the diagnosis easy. In the case of involvement of the pubis, the pubic infection was secondary to a pus infection elsewhere.

F. W. CARRUTHERS, M.D.

Dobrovolskaia, N.: Costal Osteochondritis Following Exanthematous and Recurring Typhus and Its Treatment with Iodine (Osteochondrites costales consécutives au typhus (exanthématique et récurrent) et leur traitement par l'iode). *Presse méd.*, 1921, xxix, 961.

In a review of the literature the author was unable to find the record of a single case of costal osteochondritis following typhus fever. In this article he reports several cases which developed during the typhus epidemic in Russia in 1919-20.

The onset of the costal lesion usually occurs during the period of convalescence two or three months after the attack of fever. Its first manifestation is usually noted at the costochondral juncture. The lesion is diffusely infiltrated at the onset but later becomes circumscribed and then may remain without any visible change for months. Softening ultimately occurs and an abscess with a fluctuating center is formed. Evacuation of the abscess yields a yellowish pus. This the author has found to be sterile. Many of the patients have a tuberculous diathesis or lues.

The treatment employed by Dobrovolskaia consists in rest, out of door life, heliotherapy, general dietetic measures, and the intramuscular injection of iodine with liquid iodoform as proposed by Hotz. The injection is given under local anæsthesia once a week, and the dose is gradually increased from 3 to 10 c.cm. The iodine produces a marked lymphocytosis and aids in neutralizing the toxins. Local surgical measures are strictly contra-indicated. The injection of iodine is not indicated in lesions of the lungs and kidneys. Headache or vomiting following the injection indicates the discontinuance of the medication for three or four weeks and a decrease in the initial dose. A complete cure was obtained in the majority of cases. LOYAL E. DAVIS, M.D.

Ballenger, E. G., and Elder, O. F.: The Treatment of Gonococcal Arthritis with Aspirated Synovial Fluid Injected Intramuscularly. *Surg., Gynec. & Obst.*, 1921, xxxiii, 575.

Except in acute traumatic conditions, little benefit may be expected from the treatment described when the hydrocele or synovial fluid is not infected and is free from pus cells.

Prompt improvement and remarkable cures have resulted in all cases of acute gonococcal arthritis. Since the authors began to employ intramuscular injections of synovial fluid they have found it unnecessary to resort to any other treatment such as the use of vaccines, sera, local applications, fixation, vesiculotomy, etc.

Restoration to normal has been prompt in all of the acute cases, the relief of pain occurring nearly always within twenty-four hours. The ultimate results have been equally gratifying; no ankylosis, complete or partial, has followed this treatment. In addition to the improvement in the joints, there was cessation of the symptoms of complicating acute conditions such as epididymitis, prostatitis, posterior urethritis, and seminal vesiculitis, and in cases of hyperpyrexia there was an immediate drop in the temperature.

The method is possible, of course, only for patients who have a collection of fluid in the synovial space.

Reactions following the injections were usually mild or absent.

All of the injections were given into the gluteal muscles and were repeated every two to seven days. The amount injected varied from 15 to 50 c.cm. The authors are now under the impression that the larger doses are the best, in spite of the occasional slight increase in the reaction, the production of chills, and a momentary rise in the temperature. The average number of injections administered to each patient was three, but the treatment was continued as long as there was any fluid to be aspirated.

In the authors' opinion this plan of treatment may be applied also to other conditions, such as tuberculous pleurisy with effusion. E. F. HESS, M.D.

Goljanizki, I. A.: Necrosis of Costal Cartilage Following Relapsing Fever (Zur Frage der Rippenknorpelnekrose nach Recurrens-fieber). *Sitzungsb. d. Ges. f. theoret. u. prakt. Med.*, Astrachan, 1921.

The author observed twelve cases of necrosis of the costal cartilage following relapsing fever. Nine of the patients were between 25 and 32 years of age. The first symptoms, pain and swelling, appeared from two to two and one-half months after the fever. Fistula developed in nine cases, and swelling alone in three cases. In three cases of fistula there were also closed swellings. The number of cartilages diseased ranged from four to six.

Operation was performed in most cases two or three months after the relapsing fever, but once after ten months and twice after seven months. Usually the cartilage was exposed by a flap incision. The perichondrium was then split lengthwise, the cartilage excised, and the stump covered with muscle. Three patients were operated upon four, three, and two times respectively, and the rest once. Ten patients were cured and two were discharged before treatment was completed. The pleura and the internal mammary artery were each injured once during the operation. The duration of treatment in nine cases averaged thirty days;

individual cases were treated three hundred and forty-seven, one hundred and seventy-four, and one hundred and thirty-one days.

The pathologico-anatomic changes were as follows: (1) funnel-shaped erosion of the surface of the diaphysis; (2) erosion of the edges of the diaphysis; (3) distension and erosion of one epiphysis; (4) swelling and erosion of both epiphyses; (5) complete erosion and sequestration of the whole cartilage. The first type of change was the most common (six cases). The second was found in five cases, the fifth in four, the third in three, and the fourth in only one. Four closed foci were examined bacteriologically and in every case a gram-negative short bacillus with rounded ends was cultured. In bouillon it formed short chains and caused clouding. The growth on agar was slightly slimy. Gelatin was not liquefied. The colonies on gelatin were round, light-golden, and very distinct like those of bacillus *faecalis alcaligenes*, and did not form gas; typhus serum was not agglutinated.

The microscopic examination of the cartilage in all of the cases showed very marked senile changes, degeneration in layers and vascularization; in one case tissue resembling bone marrow was found. The necrotic areas, which were filled by granulations, showed all the stages of transition from completely necrotic cartilage to normal cartilage showing only senile changes. Leucocytic infiltration was almost completely absent.

The author comes to the following conclusions:

1. Senile changes of the cartilage precede the metastatic necrosis of the cartilage.
2. Necrosis of the costal cartilages may occur in every infection running the course of a bacteræmia.
3. Conservative treatment (iodine, heat, mud baths, sanatorium care, and heliotherapy) is applicable only to the first two forms of changes mentioned and even then only in the absence of fistulæ.
4. The best results are obtained by operative treatment—wide exposure and excision of the suspected cartilage, suture, and drainage.
5. In the differential diagnosis, tuberculosis, syphilis, and actinomycosis are excluded by the acute character of the condition. The preceding bacteræmia (typhus, appendicitis, and osteomyelitis) indicates the origin of the disease. The age of the patient (25 to 35 years) favors the diagnosis of necrosis. Bacteriological examination of the pus and microscopic examination of the cartilage clinch the diagnosis.
6. The X-ray facilitates the diagnosis and treatment.

RIESENKAMPFF (Z).

Steindler, A.: Operative Methods and End-Results of Disabilities of the Shoulder and Arm. *J. Orthop. Surg.*, 1921, n.s. iii, 652.

The results in the cases reviewed are expressed in terms of function rather than in terms of anatomical re-alignment. The functional results are shown by photograph and by graphic records of progress.

For contractures around the shoulder producing adduction and inward rotation, manipulation is done under anæsthesia without excessive force. The arm is then maintained in outward rotation and abduction on an aeroplane splint. The after-treatment is begun a few days after the manipulations, and as the arm increases in strength, it is gradually let down. Three months was the average length of treatment.

If the contracture does not yield to manipulation, tenotomy of the subscapularis and pectoralis major must be done. In refractory cases it may be necessary to cut also the short head of the biceps, the coracobrachialis, and the latissimus dorsi. Five cases were treated by manipulation and six by open operation. In the operative cases the results were good in four, fair in one, and undetermined in one.

Arthrodesis of the shoulder is indicated in flail shoulder, paralysis of the deltoid from poliomyelitis which does not improve under conservative treatment, and traumatic ankylosis in poor position with atrophy of the deltoid. The joint is reached by separating the deltoid fibers through a skin-flap incision. The acromion is cut off an inch from the edge and turned upward. The head of the humerus is then pushed through a longitudinal incision in the capsule and denuded. After operation the arm is held in a cast in abduction at 90 degrees for two or three months. Then follow massage and exercises in raising the arm by means of the scapular muscles. This operation may be done as early as the fifth year of age. The results in nineteen cases were: good in fourteen, fair in two, and undetermined in three. There was bony ankylosis in eight and fibrous ankylosis in seven. In four, the type of ankylosis was not determined. The age of the patients ranged from 6 to 27 years. In five cases flexor-plasty of the elbow was done also; in two, arthrodesis of the wrist; in four, both elbow-plasty and arthrodesis of the wrist; and in one, tendon transplantation at the wrist.

For flail elbow, a transposition of muscles has been devised with the object of furnishing limited flexion power of this joint. The muscles used are the pronator teres, flexor carpi radialis, palmaris longus, and flexor carpi ulnaris. They are dissected off from their common origin on the inner epicondyle of the humerus and re-attached 2 in. higher into a point of the intermuscular septum between the brachialis anticus and the triceps muscles. The elbow is held in acute flexion for two months. Massage and exercises are included in the after-treatment. The function-results in seventeen cases in which this operation was done were good (active flexion in any position) in nine, fair (flexion in the horizontal position only) in three, and poor (no flexion) in five. Failure was due usually to a weakened condition of the muscles transplanted. The best results were obtained in cases in which arthrodesis of the shoulder was done also.

Resection and myotomies of the pronators are indicated in pronation contractures. If there is flexion contracture from ischaemic myositis or a

spastic condition, the flexor tendons are lengthened. The results in twenty-eight cases in which these procedures were carried out, either alone or combined, were good in seventeen, fair in nine, and poor in two.

Arthrodesis of the wrist is indicated in flail wrist following infantile paralysis, in drop wrist from peripheral paralysis, in spastic contractures, and in flexion ankylosis. A wedge of bone is taken out at the articulation between the radius, scaphoid, and semilunar through a dorsal incision, and the wrist is brought into dorsal flexion and secured there by sutures passed through drill holes in the bone. In the cases of twenty-five patients between 6 and 26 years of age this operation was done either alone or combined with other operations mentioned. The results were good in fourteen cases, fair in five, poor in four, and undetermined in two. In the wrist, arthrodesis is preferable to tendon transplantation.

The best results followed the combined procedures, especially the combination of shoulder arthrodesis with flexor transposition.

WILLIAM A. CLARK, M. D.

Meyerding, H. W.: Hæmorrhagic Cyst of the Upper Femur; Periosteal Sarcoma Involving the Right Knee Joint. *Surg. Clin. N. Am.*, 1921, 1, 1493.

In the discussion of two cases of hæmorrhagic cyst of the femur it is pointed out that the condition usually appears in persons less than 30 years of age; that it is always in the diaphysis; that after a slow growth the cyst appears to move upward; that it is most common in the proximal end of the shaft; that it does not cause thickening of the periosteum; that there is a fairly clear line of demarcation; that there is little pain unless secondary infection intervenes; and that limp, deformity, and fracture often occur. The cyst may be single or multilocular. The periosteum may bulge out, but this benign growth does not burst its bounds and invade, as does a malignant growth. The operative treatment consists in curetting the cavity and turning a part of the cortex into the space. The operation is followed by immobilization in a plaster cast. It is to be regretted that in the past this condition has been confused with malignancy.

In the case of periosteal sarcoma involving the right knee which is reported in this article, tuberculosis as well as sarcoma was considered a possibility before operation. Eighteen years before examination the knee had been injured, and during the succeeding years there was occasional stiffness or soreness. Following influenza in 1919, the knee became greatly swollen. The leg was amputated at the thigh, and treatment with the X-ray, radium, and Coley's serum was given. The prognosis was poor; not more than 4 per cent of persons with this condition live longer than three years. Death is usually caused by metastasis to the lungs.

H. T. JONES, M.D.

Todd, T. W., and McCally, W. C.: Defects of the Patellar Border. *Ann. Surg.*, 1921, lxxiv, 775.

The recent war directed the authors' attention to numerous cases of swelling and tenderness of the knee joint in which there was no history of trauma and the condition was not due to ordinary activities. The swelling was not great but the resultant stiffness rendered the soldier unfit for service. Continued examination led to the conclusion that these cases were due to some anomaly of the patella.

Emargination of the patella was described by Kempson in 1902 as a common variation in which there is a depression in the upper portion of the outer margin of the bone. Salmond in 1919 came to the conclusion that a fissure at the external superior angle in the neighborhood of the vastus lateralis insertion is not uncommon.

In this article are presented a number of cases illustrating patellar anomalies found in adults, such as fissures, lipping, and exuberant bone growth. Examinations of infant patellæ were made to account for them. Not more than one ossification center was found in any patella. The patellæ of twenty-three full-term fetæ were investigated. These showed an area corresponding to the typical site of emargination in which the cartilage was lighter than the surrounding cartilage and on the surface was definitely demarcated from the rest of the cartilage. The conclusions reached are as follows:

A marked defect in the upper and outer portion of the patella is to be found in 3 per cent of human beings.

This area differs from the rest of the patella even in the cartilaginous state. In the adult the development of lipping is exceedingly slow at this point.

The area is related to the insertion of the vastus lateralis tendon.

Deep pitting may occur on the surface of the patella.

No callus formation indicating fracture is to be found.

No history of trauma is given in cases of patellar defect.

These so-called "fissured fractures" are merely variations of the condition known as "patellar emargination" and are not due to trauma.

JOHN MITCHELL, M.D.

Bizarro, A. H.: On the Traumatology of the Sesamoid Structures. *Ann. Surg.*, 1921, lxxiv, 783.

Before discussing the traumatic pathology of the sesamoids, the author reports some preparatory anatomical research based on X-ray findings.

In the great toe it is the inner sesamoid which is most frequently fractured, and as in direct fractures of the patella, the most common cause is hyperextension of the muscles. Other causes, as summarized by Speed, are: (1) direct violence due to the fall of a heavy object on the foot; (2) the squeezing of the great toe between heavy masses; (3) falls from

a height on the foot; and (4) a sudden increase in weight-bearing force.

The diagnosis depends upon the degree of separation of the fragments, the unilaterality, and the irregularity of the line of division, pain, persistent swelling, tenderness, and a comparison of the X-ray findings in both feet. Crepitus is rarely noted.

The treatment is operative and non-operative. Rest and plaster fixation followed later by massage are the best measures. A metatarsal bar in the sole of the shoe is essential.

The operative treatment consists in removal of the fractured bone. Some surgeons remove the bone only when troublesome symptoms persist.

Cases of luxation of the great toe sesamoid have been reported in the literature.

Occasionally supernumerary bones of the foot may be the cause of swelling and pain, either with or without a history of trauma.

In the hand, fracture occurs most frequently in the metacarpophalangeal sesamoids of the thumb. Unlike the toe sesamoids, both of the thumb sesamoids often appear fractured.

Trigger-finger is due to injury of the fibrous sesamoids of the interphalangeal joints. In some cases it improves after a course of physiotherapy.

DANIEL H. LEVINthal, M. D.

FRACTURES AND DISLOCATIONS

Henderson, M. S.: The Status of the Bone Graft in the Treatment of Fractures. *J. Lancet*, 1921, n.s. xli, 611.

The bone graft may be used in cases of recent fracture, but is rarely necessary. In delayed union and non-union it offers the most certain method of treating a difficult group of cases successfully. The inlay graft or the massive graft is to be preferred to the intramedullary method since the former brings into apposition a larger area of bone forming elements. The rôle of the periosteum in bone formation is still debatable, but to trust to it alone in the treatment of fractures is to court failure. As the hard cortical bone has little regenerative power, the endosteal layer in which the osteoblasts abound must furnish most of the new bone cells.

The massive graft is used wherever practical. It is especially applicable to the bones of the forearm. The cortical bone of the fragments is chiseled away to expose the endosteal layer and a large graft is placed with its endosteal layer in contact with that of the fragments and held in place by beef bone screws penetrating to the opposite cortex. In order to prevent refracture during the period of absorption the graft should be large enough to increase the diameter of the bone by about 20 per cent. It is probable that in most cases the graft itself is absorbed, at least partly, and replaced by the growth of new bone from the fragments. For this reason adequate postoperative fixation is necessary for a considerable period of time.

A group of cases is reported to illustrate the type of operation in various regions of the body and to show some of the difficulties encountered. In a few cases metal plates were used, especially in the femur, in order to shorten the time of operation. In others, beef bone plates were applied. These do not have to be removed. J. I. MITCHELL, M.D.

Corlette, C. E.: A Simple Operative Method of Reducing Obstinate Malposition in Colles Fracture and in Supracondylar Fractures of the Humerus. *Med. J. Australia*, 1921, ii, 397.

The author has devised a very satisfactory method of reduction for certain cases of Colles fractures and transverse supracondylar fractures of the humerus.

After the fracture has been X-rayed in two planes at right angles to each other, one or two small incisions are made over the distal fragment, a small sharp hook is introduced so that the points engage the edge of the distal fragment, and with the aid of traction in the proper direction the impaction is broken up and the fracture reduced. The case is then treated as a simple fracture. The incisions are made over the distal fragment so that traction will not stretch the skin too much.

J. W. POWERS, M.D.

Schurmeier, H. L.: The Mechanics of Fractures at the Wrist. *J. Am. M. Ass.*, 1921, lxxvii, 2119.

The Colles type of fracture is caused by a fall upon the outstretched arm with the hand in extension, slightly abducted, and dorsiflexed.

As the carpal and metacarpal bones are joined together very firmly, the wrist moves in extension and flexion as one bone. A fall upon the wrist causes great leverage upon the radiocarpal ligament and this is increased by the prominent projecting anterior lip of the lower end of the radius. Consequently the radius is fractured by the avulsive force of the radiocarpal ligament. The sudden impingement of the carpal bones against the articular surface of the radius and the splitting of the lower fragment by descent of the lower end of the upper fragment must also be considered.

Seventy-five per cent of chauffeurs' fractures are intra-articular. This fact the author attributes to the mechanics of the fracture. The hand is held rigidly parallel with the arm in abduction, exhibiting no dorsal flexion. The lines of stress are through a point to the ulnar side of the thenar eminence and the force of the blow is transmitted by the scaphoid which presents a wedge-shaped edge to the radius.

JOHN MITCHELL, M. D.

Galloway, H. P. H.: Treatment of Fracture of the Neck of the Femur. *Surg., Gynec. & Obst.*, 1921, xxxiii, 602.

Fractures of the neck of the femur are divided into several groups. The first are those occurring in persons of advanced age, poor general physical condition, and low resistance. In such cases the saving

of life is paramount and the treatment of the fracture is secondary. The second group are those occurring in persons who recover rapidly from the first shock of the accident and whose physical condition permits treatment of the fracture. This group includes most cases of impacted fracture and also epiphyseal separation and fracture of the neck of the femur occurring in early life. The same general line of treatment is employed in all.

It is the author's opinion that Whitman's abduction treatment will give a larger percentage of good results than any other method. The patient is placed on a Hawley table or similar apparatus, and while the surgeon raises and presses upon the trochanter so as to guide it to its normal position, sufficiently strong manual traction is exerted by assistants to equalize the length of the limbs. When both limbs are of equal length the affected limb is rotated inward and then both limbs are abducted simultaneously to the extreme limit and a plaster spica is applied from the nipples to the toe with the knee slightly flexed and the foot at right angles. A window may be cut over the abdomen and also over the knee to permit daily passive movements of the patella. Following the removal of the cast at the end of three months, massage, passive movements, and functional muscle training are given. In the cases of adults direct weight-bearing should not be permitted until after six months. The progress of repair can be judged by the findings of repeated X-ray examinations, the extent of passive manipulation, and the return of voluntary muscle control. In most cases it is advisable for the patient to wear a caliper splint for several months.

For moderately impacted fractures with little shortening and moderate outward rotation a caliper splint or merely a stout stick may be employed after a short period of confinement to bed. Massage should be given during the entire course of treatment. The more severe cases of impaction should be treated by the abduction method.

A third group of cases consists of those in which discomfort, pain, and disability persist weeks, months, or even years after the original injury. This group may again be subdivided into, first, those of persons of advanced age and poor general health. For these, radiant heat, massage, gentle passive movements, exercises, and a comfortable shoe with sufficient cork elevation to compensate for the shortening should be prescribed. The second subgroup consists of the cases of persons in good general physical condition and with sufficient power of resistance to permit operative interference. The author suggests the following procedure:

The hip joint is exposed by a Kocher incision 8 in. in length, the capsule is split along the axis of the neck, and the base of the neck is divided from the trochanter with a wide osteotome. The head and neck are removed and the trochanter is implanted into the acetabulum with the limb in abduction. The incision is closed and a plaster spica applied from the nipples to the toe in the abducted position.

Removal of the plaster after five or six weeks is followed by massage and gentle manipulation. Shortly afterward the patient is permitted to leave his bed on crutches. There will then be very little discomfort and only a slight amount of shortening. On weight-bearing the trochanter tends to travel outward and rests upon the upper portion of the rim of the acetabulum. In the author's opinion this procedure is much more simple and gives a better functional result than freshening of the fractured surfaces or bone grafting.

RUDOLPH S. REICH, M. D.

Ruth, C. E.: Fractures of the Femoral Neck and Trochanters: A Rational Treatment. *J. Am. M. Ass.*, 1921, lxxvii, 1811.

In fractures of the head and neck of the femur the iliopsoas muscle, normally an internal rotator, becomes an external rotator and thus is the greatest factor tending to displacement and non-union.

Successful treatment of hip fractures depends upon reduction and maintenance of the reduction until the callus is hardened sufficiently to withstand the normal muscle pull.

The capsular ligament, because of its anatomical relation to the hip joint, serves to help in reducing the fractured neck and in maintaining the reduction. The blood supply to the neck of the femur is derived from two sources: arteries supply the trochanters and distal part of the neck, while the proximal end of the neck is supplied by way of the ligamentum teres.

All successful methods of treating fractures of the neck depend upon the use of the capsular ligament as a splint. To obtain this tension of the capsule the author uses traction in two directions, i.e., heavy longitudinal and lighter outward, upward, and forward traction. A piece of fiber or binder's board 4 or 5 in. wide, long enough to encircle the thigh two-thirds, and curved to fit its inner surface is well padded with cotton. A 4-in. strip of adhesive plaster is applied to the inner surface of the thigh close up to the perineum and carried under around the thigh to the outer side. The binder's board is then applied to the inner surface and the adhesive plaster brought over it. Another strip is passed entirely around the thigh over the binder's board. The free end is attached to cords running laterally over pulleys for traction.

In reduction the operator flexes the knee on the thigh and the thigh on the trunk, both to a right angle, at the same time increasing the eversion. This frees all soft parts between the fragments. With the joints flexed, the knee is brought to the midline, extension is made on the thigh to raise the trochanter to the normal level, and the leg is extended under heavy traction. The lateral and longitudinal weights are then attached. Traction is continued for four weeks.

Impacted fractures of the neck become disimpacted without treatment because of the absorption of the roughened bone at the fracture line. Impacted

fractures without displacement do not require the breaking up of the impaction.

Fractures through the base of the neck are treated in the same way, the capsular ligament serving as a splint.

Trochanteric fractures vary in their characteristics. The dense aponeurotic investment of the gluteals usually prevents wide separation of fragments of the greater trochanter. In fractures in which the lesser trochanter is torn off, the iliopsoas is carried with it, and eversion of the limb results. In such cases the Hodgen splint and Balkan frame are of aid.

The author concludes with the statement that successful treatment depends upon accurate diagnosis, complete reduction, sufficient traction, and daily verification of the position of the fragments by the X-rays.

JOHN MITCHELL, M. D.

Ridlon, J.: Final Results of Fracture of the Neck of the Femur without Treatment, or with Worse Than No Treatment. *J. Am. M. Ass.*, 1921, lxxvii, 1815.

In a study of the results of fractures of the neck of the femur during the past twenty-nine years the author found that in many cases they were excellent although no treatment whatsoever had been given. He does not advocate non-treatment, but believes that good results are sometimes due fully as much to the natural tendency of fractures to unite as to the treatment they receive.

As there is little external callus in intracapsular fractures, weight-bearing must be delayed. The abundant callus in fractures of the shaft permits earlier use of the part.

The principles of treatment should be the same as for other fractures. Following as accurate approximation of the parts as possible, they should be immobilized until union has taken place and the limb should not be used for full weight-bearing until the union has become strong.

The author advocates Whitman's method of traction, abduction, and inward rotation of the limb and immobilization in a plaster cast. Impacted fractures with no more than $\frac{3}{4}$ in. of shortening should be treated with a Thomas hip splint or a plaster cast without disengaging the impaction. Patients who cannot be treated by either of these methods should rest in bed for at least four months without treatment, and should not bear their full weight on the leg as long as any sensitiveness persists. A good result may be expected in more than 50 per cent of the cases in which this regime is followed.

No case of hip injury should be treated as a dislocation until dislocation has been proved. When a limb is adducted, rotated outward, and short, a fracture of the neck of the femur is to be assumed because following a dislocation, which usually occurs backward and upward, the limb is short, rotated inward, and somewhat flexed.

DANIEL H. LEVINthal, M. D.

Santoro, E.: A Case of Pathologic Fracture of the Femur Due to Cancer Metastasis Followed by Consolidation (Su di un caso di frattura patologica del femore da metastasi cancerigna seguita da consolidazione). *Riforma med.*, 1921, xxxvii, 1119.

The patient was a woman, 56 years of age, who had been operated upon a short time before for cancer of the left breast. The fifteenth day after the operation she began to feel sharp pain in the upper part of the right thigh, and soon thereafter, while walking, experienced a sudden, violent, and acutely sharp pain in the same area which was followed by lack of power to move.

Examination by the author four months later led to the diagnosis of a pathologic subtrochanteric fracture of the right femur which had become consolidated by a strong bony callus and was associated with a posttraumatic varus. The woman died about three years later, her general condition having become progressively worse.

There are numerous causes for pathologic fracture, and the diagnosis is relatively easy. The fact that in this case the abnormal fragility of the femur was due to a metastasis from the mammary cancer was shown by the X-ray and suggested by the history. Osseous metastases are not rare in cases of cancer of the breast, being next in frequency to metastases in the liver and lung. Moreover, those in the femur take second place. The radiographs in the case reported showed a consolidated fracture at the level of the lesser trochanter. Evidently it was transverse, and a deformed consolidation, a traumatic coxa vara, had resulted.

The importance of the case lies in the fact of consolidation. Gurlt in 1862 collected thirty-eight cases of spontaneous fractures due to cancer, in ten of which consolidation occurred. The author believes the latter figure is incorrect as he has been able to find the report of only one such case, that published by Freeman.

A histologic examination of the breast cancer or even of the metastatic focus in Santoro's case would have been of interest. Santoro believes that in all probability it would have shown an osteoplastic carcinoma as it is only in cases of this type of tumor that consolidation is possible.

W. A. BRENNAN.

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Gluck, T.: Osteoplasty (Ueber Osteoplastik). *Arch. f. klin. Chir.*, 1921, cxvii, 13.

Gluck has done osteoplasty for forty-five years. To complete his previously published articles on the subject (1890, 1893, 1917-18), with which also the names of Ollier, Langenbeck, Koenig, Bier, Lexer, Payr, and others are identified, he reports the permanent results obtained with this method, some of which, observed for decades, are astonishing. He calls attention to the fact that the heteroplasty originated by him has acquired a varied and successful application and has become an indispensable

adjunct of plastic surgery. Although the fate of the autotransplanted bone has not been determined definitely and it is not known whether the bone substance, periosteum, and marrow remain alive, the value of osteoplasty is acknowledged.

The main feature of the author's osteoplasty, whether living or dead bone or a foreign body is used, is the conducting, supporting, and splinting action of the transplant around which the new bone forms. At the same time, the transplant causes powerful stimulation to bone formation. Foreign bodies of organic or metallic nature may serve temporarily or permanently for fixation. A fact of practical importance is that the substituting prosthesis functions before the substitution has ended and before it has begun. The matrix possessing the power of proliferation is stimulated to specific activity by the functional stimulation and in the course of time produces the normal formation. To a certain extent surgery gives nature the building stones and the plan, and nature, with surprising perfection, fulfills the surgeon's intention.

VOLLHARDT (Z).

Mamourian, M.: On the Bone Graft. *Brit. M. J.*, 1921, ii, 934.

Bone grafting is acknowledged to be the most effective method of repairing bone. Extensive experimental and chemical studies have not yet solved the problem of how this is accomplished. In the author's opinion the action of the graft is biochemical. The graft supplies the stimulating irritant and new bone is formed by the diaphyseal ends, the periosteum, the remains of bone in the shaft zone, and, in the young, by epiphyseal lengthening. Mamourian agrees with Murphy that the graft is absorbed and functions only as a scaffold.

The importance of Wolf's law, the author believes, has been exaggerated. In most instances the post-operative treatment of a grafted limb includes immobilization. This causes atrophy of the recipient bones. Can it be claimed also to cause growth of the graft? Macewen's classical result is explained, not by the growth of the graft, but by the growth of the bone fragments adherent to the membrane lining the tract.

Osteoblastic and osteoclastic forces must be equal to insure the formation of new bone in proportion to the absorption of the graft. If absorption proceeds at a more rapid rate, fracture of the graft is apt to occur. Callus appearing at the site of a fractured graft has been thought conclusive evidence of the survival of the graft. The author believes that it is only the result of a greater local stimulus.

A change in the character of the transplanted bone is also questioned. The fact that after an Albee graft to the spine only cancellous bone may be found bridging the vertebræ Albee explains by the assumption that the graft has histological as well as morphological adaptability. The author believes that the dense bone of the tibia is replaced entirely by cancellous bone from the vertebræ. Unless the graft is

thus replaced so that it is indistinguishable after six months, necrobiasis is present. Infection is not thought to be a serious obstacle to successful bone grafting. According to Wheeler, a bone graft has inherent bacteria-resisting properties. This the author interprets to mean that the graft is a poor culture medium and the cellular activity of the graft bed inhibits the septic process. That infection stimulates osteogenesis is proved by the formation of involucrum in osteomyelitis and the ankylosis of infected joints. An involucrum is not formed in tuberculous bone lesions or in bone tumors which are osteo-depressant. The author believes that the new bone and cellular life following the transplantation of a graft is capable of overcoming pyogenic or tuberculous bone infections and may revive normal osteogenesis in bone destroyed by tumors of low malignancy.

Four cases are reported with roentgenograms made before and at intervals after operation.

J. I. MITCHELL, M.D.

Bradford, E. H.: The Treatment of Caries of the Hip Joint and Some Observations upon the Use of a Traction Abduction Splint. *Surg., Gynec. & Obst.*, 1921, xxxiii, 700.

In a large number of cases hip disease may be permanently cured. The surgical indications are not fully met by the plaster-of-Paris spica as it does not furnish adequate fixation or prevent upward hip-bone crowding by the contracting muscles.

Bradford has obtained satisfactory results with his abducting extension splint even in advanced cases. The splint should not be applied until the flexion and adduction deformity is corrected. It can be used as an ambulatory splint, preferably with crutches, and can be applied at night. The continued wearing of the splint is indicated as long as muscular spasm is present. As spasm subsides the traction should be reduced.

For the treatment of desperate cases in which the acetabulum is seriously involved the author advocates the forcible dislocation of the head of the femur from the acetabulum through a posterior incision. The deformity can be corrected after the disease has subsided. The article is illustrated by eleven cuts.

JOHN W. POWERS, M.D.

Moorhead, J. J.: Knee-Joint Injuries. *Surg. Clin. N. Am.*, 1921, i, 1597.

Joint injury may be intra- or extra-articular and may involve the bony structure or the soft parts. The knee joint with its numerous bursæ, its many pouches, and its large area of synovial membrane offers an opportunity for skillful diagnostic acumen.

Contusions or contusion sprains are the most common injuries of the knee joint. Next in the order of their frequency come synovitis, bursitis, loose bodies, tears of the crucial ligament, fractures of the patella and the margins of the femur or tibia, fractures of the tibial spine, and dislocations of the joint.

Because of the prominence and contour of their inner margins the tibia and femur are liable to injury. There are twelve bursæ connected with the knee joint: three in front, four on the outer side, and five on the inner side. Of these, the prepatellar bursa is the most important surgically. The crucial ligaments, anterior and posterior, serve to give stability to the joint. The anterior is the most important surgically. It is attached to the depression in front of the tibial spine and the front end of the external semilunar cartilage and then passes to the inner and back part of the outer condyle of the femur. The posterior crucial is more vertical, is attached to the depression behind the tibial spine, the popliteal notch, and the posterior end of the external semilunar cartilage, and passes to the front part of the internal condyle of the femur.

The chief function of the crucial ligaments is to give stability to the joint. The anterior crucial is taut in extension and the posterior tibial is taut in flexion.

The semilunar cartilages serve as shock absorbers and also deepen the pockets on top of the tibia. The internal semilunar is semicircular. The external semilunar is almost circular. The attachments of the external semilunar are much more secure than those of the internal.

The internal crucial ligament is more liable to injury than the external because it is weaker, longer, and more oblique, and has fewer supports. The internal semilunar is more vulnerable than the external because the latter is larger and more nearly circular, and is grooved for a muscle.

Injection of the knee joint with oxygen aids in the diagnosis of knee-joint conditions, especially synovitis. The needle is introduced just outside the external margin of the patella, at about its center. Enough oxygen is introduced to distend the joint slowly and completely. Radiograms are made in four directions, from before backward and the reverse and from within outward and the reverse.

Traumatic synovitis is treated by immediate aspiration and mobilization. This newer method limits the possibility of stretching the synovial capsule and the contiguous parts. Re-effusion may occur after the first day but this need not interfere with the use of the joint in walking even when it is painful and swollen. Subacute or chronic traumatic synovitis is treated in the same way, but massage is used to aid the recovery of the atrophied muscles about the joint. Synovitis from infection such as tuberculosis or syphilis is not included in this treatment.

Purulent synovitis is treated by repeated aspiration and the injection of ether, incisions at the borders of the patella, or splitting of the patella according to the severity of the condition. In desperate cases the joint is irrigated every two hours with Dakin's solution.

Crucial ligament injuries are diagnosed too infrequently. Tears of the anterior crucial ligament are often produced by trauma incurred with the leg

extended, internally rotated, and abducted. Displacement of the tibia forward on the femur makes a diagnosis of ruptured anterior crucial ligament reasonably certain.

The treatment is non-operative or operative. Non-operative treatment consists of aspiration of the bloody fluid and posterior splinting for three to six weeks. The purpose of operative treatment is to anchor the torn ligaments to the femoral condyle.

Dislocation of the semilunar cartilage is apt to occur when strain is exerted upon the knee and the joint surfaces are unapposed. Rotary flexion of the knee joint with fixation of the foot or leg is the primary cause. The symptoms depend upon the severity of the injury.

When localized tenderness is apparent over the cartilage the possibility of injury must be kept in mind. In cartilage injury local tenderness and limitation of full extension are signs of importance. In crucial ligament injuries rotation and forward and backward motion of the knee joint are increased. In cases of mild injuries the treatment is non-operative. Fixation of the joint until tenderness and pain have disappeared is all that is necessary. Operative treatment is advised only when the diagnosis is confirmed by examination, X-ray, or a history of repeated attacks.

A vertical 3-in. incision is made directly upon the injured cartilage. The knee is best explored in the right-angle position. A hook is introduced and the fractured or dislocated cartilage is withdrawn. When the diagnosis is not wholly clear, the split patella operation is advised for exploration. The postoperative treatment consists in splinting posteriorly and the removal of the splint daily for exercise. After the seventh day the splint is discarded and the patient forced to use the limb.

Injury to the tibial spine is relatively rare, although in many cases of dislocation of the knee the tibial spine is avulsed. Prolonged rest effects a cure in most cases.

Loose bodies in the knee joint are due to disease or trauma. They may be solitary or multiple. The diseases giving rise to them are rheumatoid arthritis, osteo-arthritis, Charcot's joint, some neuropathies, and osteochondritis. The symptoms are pain, synovitis, weakness, and slipping or locking followed by re-effusion. The X-ray may fail to reveal the condition unless oxygen is injected into the joint. The treatment is operative. JOHN MITCHELL, M.D.

Bérard, L.: The Treatment of Vicious Ankylosis of the Knee Due to Tuberculous Tumor in the Adult (Traitement des ankyloses vicieuses du genou consécutive à la tumeur blanche chez l'adulte). *Rev. de chir.*, Par., 1921, xl, 503.

In an experience of twenty-five years Bérard never saw a case of tuberculosis of the knee with a fungoid osseous and synovial lesion and with or without suppuration which was cured by conservative methods if the patient was older than 18 years. He does not wish to say that resection should be done in

every case of proved tuberculosis of the knee in the adult, but believes it is indicated when, after a fair trial of conservative methods for four to six months, there is no definite improvement and the patient has almost reached his full growth. The technique recommended is very similar to that of Ollier.

Bérard, like the majority of French surgeons, performs the resection without the previous application of an Esmarch band. Hemostasis is effected following the section of the vessels, and the wound is closed without drainage. The limb is immobilized in a plaster cast for forty-five days, and for two months longer a plastic canvas protective cover is worn, the patient during this time walking with the aid of crutches.

Eight cases of vicious ankylosis of the knee due to tuberculosis have been treated by Bérard during the past ten years. The patients were all more than 17 years of age, and the results in all of the cases were nearly the same. On getting up at the end of sixty days the patient was able to resume walking almost immediately. At the end of the fourth month he was fitted with an orthopedic shoe having a metal bar extending to the mid-thigh. In some cases this was worn for a year but in others an ordinary high-heeled shoe was worn at the end of the sixth month. Two of the patients are now working at farming. In no case has there been any lesion necessitating further operation, and with the exception of two cases which were operated upon ten months ago, the cures date from one to nine years. The amount of shortening ranges from 4 to 7 cm., depending upon the age of the lesion, the patient's age at which it developed, and the degree of atrophy of the affected limb. In three cases there were more or less quiescent tuberculous lesions in the synovia and the bony extremities of the joint at the time of operation and therefore the ankylosis was not complete. In the five other cases complete ankylosis had been established for several years.

In cases of incomplete ankylosis the method of resection should be the same as that used in cases of tuberculous tumor in the process of evolution. In cases of old and solid ankylosis a cuneiform and trapezoid osteotomy should be done without effort to seek the articular space. If the resection is too economical, a second operation will be necessary because of the retraction of the soft parts.

W. A. BRENNAN.

Weatherbe, P.: Cases of Infected Knee Joint Treated by Incision, Drainage, and Movement.
Lancet, 1921, cci, 1271.

When a diagnosis of septic knee joint is made, treatment should be begun at the earliest possible moment. This should consist of free opening of the joint by lateral incisions, 4 to 6 in. long, on either side of the patella followed by thorough irrigation, the breaking down of all adhesions, manipulation by full flexion and extension, the introduction of several rubber drainage tubes, the application of wet boric lint covered with oiled silk, and the

establishment of continuous drainage of the joint by capillary action. The dressing should be changed once a day with removal of the tubes and irrigation, full flexion, and extension of the joint.

This treatment should be repeated daily until the wounds are healed. Failure will occur if any of the details are not observed; that is, if the incisions are not large enough, if the joint is not fully flexed each day, or if the dressings are not kept wet or are discontinued before the wound has thoroughly healed. The changing of dressings and the movement of the joint are comparatively painless. This method of treating septic knee joints apparently gives the best prognosis as regards both life and function.

J. I. MITCHELL, M.D.

Ober, F. R.: Immobilization Treatment of Septic Knee Joints. *J. Orthop. Surg.*, 1921, n. s., iii, 689.

This article is based on about 100 war cases. Although mobilization treatment is ideal, it has its limitations: it must be begun very early, the joint must be capable of active function, and the care of the case must be entrusted to only well-trained nurses or orderlies. It is therefore necessary in some instances to fall back on the immobilization method.

In the cases reviewed the knees were immobilized on Thomas splints at an angle of about 160 degrees, this amount of flexion giving greater comfort than complete extension. Traction was applied to the leg and suspension secured in a Balkan frame or bed cradle. Dressings were done without bandaging. Passive motion was avoided because it was always followed by a rise in the temperature. Irrigation was abandoned because it always caused a relapse. Carrel-Dakin treatment was tried but this method also was given up as it did not hasten progress. Cases dressed every day did not progress so well as those dressed less frequently. Operations were reduced to the minimum as synovial membrane is usually able to take care of itself if given a chance, frequent operations under anesthesia reduce the patient's resistance, and often all that is necessary is a simple incision at the most prominent or dependent part of the pus pocket and the insertion of a tube.

The article is concluded with the following summary:

1. Mobilization will not always replace immobilization as there are many cases in which mobilization is contra-indicated.
2. Careful attention to minor details in the adjustment of the splint and in bed nursing increases the patient's comfort and resistance.
3. A bent Thomas splint is more comfortable than a straight one and more easily managed.
4. Slackness and carelessness will always be followed by disaster.
5. Surgical interference should be gentle and precise.
6. Passive manipulation, irrigation at the time of dressing, and frequent changing of dressings tend to prolong the septic condition.

WILLIAM A. CLARK, M.D.

Orr, T. G.: A Technique for Leg Amputation.
Ann. Surg., 1921, lxxiv, 633.

The author offers a technique of amputation devised to eliminate tender scars, ulcers, and sensitive neuromata.

Long anterior and short posterior flaps are made. The resulting scar is thus posterior and free from attachment to the bone. The deep fascia is included in the anterior flap.

The posterior flap is quite short and is dissected free only a short distance from the cut end of the bone. The muscles are divided 2 or 3 cm. below the tibial end. The fibula is cut 1 cm. shorter than the tibia. The periosteum is removed 0.5 cm. above the cut ends and the marrow scooped out. Sharp bone edges are smoothed with a rasp. The nerves are freed, drawn out as far as possible, and injected with absolute alcohol. The nerve is then divided just below the injected area.

The entire muscle mass is grouped by means of a chromic pursestring over the anterior beveled portion of the tibia. Muscle flaps are not made. The posterior fascial flap is sutured over the stump. The anterior fascial flap is then drawn backward and sutured so that two layers of fascia cover the stump. The skin is closed and a small drain placed beneath the flaps.

JOHN MITCHELL, M.D.

Noall, W. P.: The Treatment of Neglected Cases of Club-Foot. *Brit. M. J.*, 1921, ii, 1109.

Talipes equinovarus, a most frequent deformity following infantile paralysis, is characterized by shortening, atrophy, coldness, and bluish discoloration of the affected limb. The heel is raised with the foot inverted and adducted. There is prominence of the head of the astragalus on the dorsum of the foot with moderate compensatory scoliosis which disappears when the patient is lifted up. The patient walks on the outer border of the foot, and this may cause inward rotation of the lower leg. The treatment is as follows:

The tense plantar fascia and inferior and internal portions of the astragaloscaphoid capsule and the long and short plantar ligaments are divided. The foot is stretched as much as possible. The astragalus is exposed by an incision over its inner side. The periosteum and ligamentous capsule are separated, and the head, part of the neck, and the adjacent surface of the scaphoid are removed with a sharp chisel. The adjacent surfaces of the calcaneocuboid joint are then removed. Sections of the mediotarsal joint are cut away in order to overcome the varus deformity, and the wounds are closed. In some cases it may be necessary to transplant a strong tibialis anticus to the dorsal surface of the cuboid to make it an inverter of the foot. The tendo achillis is lengthened by a Z-shaped incision and the foot held in an over-corrected position by means of a plaster cast extending from above the knee to the toes. After six weeks the cast is removed, massage is begun, and the patient is measured for shoes and leg-

irons. The foot is returned to the cast until the braces are procured. The braces should have a stop joint at the ankle to limit plantar flexion though permitting dorsiflexion, and a varus T-strap to prevent the return of the varus deformity. Shortening may be compensated for by a cork sole.

A person with talipes calcaneocavus walks on the back of the heel. The foot in front of the mediotarsal joint is dropped downward. The first stage of the corrective operation consists in opening the mediotarsal joint on either side of the foot and removing from the tarsus a wedge-shaped piece of bone with its base upward. An additional varus deformity is corrected by removing a broader external wedge, and a valgus deformity by removing a broader internal wedge. A plaster cast is applied for four or five weeks. The second stage of the operation consists in the correction of the calcaneus deformity by dividing the anterior ligament of the ankle joint, shortening the tendo achillis, and removing a wedge with its base backward from the back of the astragalus. The foot is then held in an over-corrected position by means of a plaster cast. Removal of the cast in six weeks is followed by massage and, if necessary, the use of braces with a T-strap.

Talipes plantaris is bilateral and may be caused by the wearing of short shoes or by neuritis affecting the extensor muscles of the foot following some infectious fever of childhood. The treatment is the same as that for talipes equinovarus. The author has found that after the operation the affected limb grows more quickly than the sound one.

R. S. REICH, M.D.

Soule, R. E.: The Value of Bone-Pin Arthrodesis in the Treatment of Flat-Foot. *J. Am. M. Ass.*, 1921, lxxvii, 1871.

The author calls attention to his operation for the pronated relaxed flat-foot. This condition comprises from 70 to 80 per cent of all cases of flat-foot, and is the most difficult to cure permanently. Over half of the cases are of congenital origin.

The foot and leg having been prepared and a tourniquet applied above the knee to insure a bloodless field, the astragaloscaphoid joint is exposed through a skin incision from 1½ to 2 in. long on the dorsum of the foot, along the course of the anterior tibial tendon. The astragaloscaphoid ligaments are dissected away, and the forefoot plantar flexed to expose the joint surfaces.

With the author's double curved osteotome, 5/8 in. wide and curved to conform to the ovoid of the head of the astragalus, the adjacent joint cartilages are removed from the astragalus and scaphoid with preservation of the normal curved-surface contact when the forefoot is restored to the desired relation to the leg. At the distal end of the skin incision the mesial projection of the scaphoid is exposed. The foot being held by an assistant in its corrected position, a drill is driven through the mesial projection of the scaphoid into the head of the astragalus to a depth of 1½ to 1¾ in., depending on the size of the

bones. The drill is then disengaged from the motor and left in place while the bone pin is removed from the antero-internal surface of the tibia and shaped to fit the drilled hole. The foot is again securely held in position while the drill is removed and the bone pin substituted.

The skin wound is closed by a continuous catgut suture without drainage. Flat dressings are covered by a flannel bandage from the toes to the knee and a plaster-of-Paris cast applied with the foot at a right angle to the leg. Following the removal of the cast at the end of four weeks, active and passive movements are instituted. Light weight-bearing is begun the sixth week, and after the eighth week full weight-bearing is allowed with caution to avoid over-fatigue of the foot and leg. Massage and active and passive exercise are continued to hasten the restoration of muscle tone.

The cases the author reports include ten treated in 1915 (ages 7 to 36 years), nine cases treated in 1916 (ages 6½ to 56 years), two cases treated in 1917 (ages 9 and 35 years respectively), one case treated in 1919 (age 28 years), three cases treated in 1920 (ages 12 to 35 years), and four cases treated in 1921 (ages 12 to 45 years). In all, thirty-eight feet were operated upon.

The bone-pin arthrodesis was done to relieve: (1) the disability due to congenital pronated painful foot; (2) relapsing rigid flat-foot; (3) osteo-arthritis of the feet with pronation; (4) rheumatic arthritis of the feet with pronation; (5) valgus foot deformity due to infantile paralysis or some other acquired permanent paralytic valgus deformity; (6) pronated feet of mentally defective patients; and (7) fracture of the midtarsal bones with pain.

F. W. CARRUTHERS, M.D.

SURGERY OF THE SPINAL COLUMN AND CORD

Widerøe, S.: Intraspinal Injection of Air and Its Diagnostic Importance in Lesions of the Spinal Cord, Especially Tumors (Ueber intraspinale Luftinjektion und ihre diagnostische Bedeutung bei Rueckenmarksleiden, besonders bei Geschwuelsten). *Norsk Mag. f. Lægevidensk.*, 1921, lxxxii, 491.

In a woman 39 years of age there developed in the course of one and one-half years the symptoms of a tumor of the spinal cord the situation of which, according to the best neurological authority, was at the level of the sixth dorsal vertebra. November 24, 1920 a laminectomy from the fourth to the eighth dorsal vertebra was performed but with a negative result. The patient left the hospital three weeks later. At first there was improvement but this did not continue.

January 7, 1921, the patient re-entered the hospital. The site of the tumor was then believed to be at the level of the eighth cervical and first dorsal segments. January 8, an intraspinal injection of air was given. Sixty-seven cubic centimeters of spinal fluid were withdrawn and 50 c. cm. of air injected without any subjective difficulties. The roentgen picture showed a considerable accumulation of air on the upper surface of the brain but not in the ventricles. A picture of the upper part of the column showed no air in the spinal canal. After eight hours there was sudden severe pain at the level of the vertebra prominens radiating to the upper portion of the breast and the head, chiefly on the left side. These attacks came on at intervals of a few minutes and lasted from three to four hours. January 12 a laminectomy of the sixth and seventh cervical and first dorsal vertebrae was done. The operation revealed a bluish-red, soft tumor 1½ by 3½ cm. in size on the anterior side toward the left, corresponding to the neurological findings. This was extirpated. Histologic examination showed the growth to be a psammo-endothelioma. Objective and subjective improvement followed the operation.

This case presented difficulties with regard to the segmental diagnosis over a long period. Between the operations, however, the symptoms developed so quickly that in the second examination the segmental diagnosis could be made with fair certainty. The intraspinal injection of air was very helpful. This method of examination has not been used before in cases of cord tumors.

The injection of air into the spinal column was first performed by Dandy of Baltimore in order to force air into the ventricles and subdural space. The author has used the method in ten cases of various diseases of the central nervous system. The technique employed is as follows:

Local anæsthesia is induced and the patient placed generally in the sitting position but occasionally in the reclining position with the head 20 to 30 degrees higher than the pelvis. From 6 to 10 c. cm. of spinal fluid are withdrawn and replaced by 3 to 5 c. cm. of air injected at intervals until the desired amount has been introduced or until symptoms appear that make it desirable to stop. The needle is left in place a few minutes after the last impulsion of air in order to allow any possible excess to escape. In every case the amount of fluid removed is greater than the amount of air introduced. The examination must be performed slowly and with care. Usually it consumes about half an hour. On an average, 70 c. cm. of fluid are withdrawn and 47 c. cm. of air are injected.

On the basis of symptoms caused by the insufflation the author divides his cases into four groups:

Group 1, four cases in which there were changes of hydrocephalic nature but no subjective symptoms.

Group 2, two cases in which there was pain associated with cerebral symptoms, humming in the ears, headache, and bursting pressure in the head.

Group 3, a case of cerebral lues and a case of epilepsy. In the first case there were radiating pains in the legs after each injection. In the second, gradually ascending and radiating pains followed each injection. When less than 3 c. cm. of air were injected there was no pain. In a physiologically or pathologically narrowed canal the air in its ascent causes radiating pain by exerting pressure in the narrow parts.

Group 4, a case in which pain developed after several hours and then remained constant at the level of the vertebra prominens where a tumor was found. From here it radiated to the thorax. After the attacks there was headache. These symptoms can be caused only by the injection of air; they are due to the passage of the air through a narrow area in the subdural space.

These cases show that the intraspinal injection of air may be valuable as an aid to the diagnosis of narrowing of the spinal canal, especially that due to tumors of the spinal cord. KORITZINSKY (Z).

Elsberg, C. A.: The Diagnosis and Surgical Treatment of Tumors in Front of the Spinal Cord. *Surg., Gynec. & Obst.*, 1921, xxxiii, 670.

Tumors growing on the anterior surface of the spinal cord—whether they are extradural or intradural—give rise to symptoms which are often difficult to differentiate from those of intramedullary growths. For this reason surgical interference is often delayed until marked cord symptoms have appeared. In order to expose and remove anterior tumors the surgeon must draw the cord over to one side after he has performed the laminectomy and incised the dura. Even when the manipulations are carried out with gentleness and care, the danger of injury to the delicate cord tissue is very great.

About 10 per cent of extramedullary spinal tumors are anterior and anterolateral to the spinal cord.

The author describes his technique in the removal of these tumors and emphasizes the fact that when an anterior tumor is extradural the transdural approach will endanger the cord less than the extradural approach.

FREDERICK CHRISTOPHER, M.D.

Neuhof, H.: A Large Cervical Cord Tumor with Slight Sensory Manifestations: Laminectomy and Radical Excision of the Tumor: "Cure" Not Complete Two Years After the Operation. *Surg. Clin. N. Am.*, 1921, i, 1699.

The patient, a man 47 years old, experienced stinging pain in the third, fourth, and fifth fingers of the left hand for the first time eight months previously. This was followed by wasting of the muscles of the forearm and shoulder, stiffness of the legs and right arm, and difficulty in urination.

The other symptoms and signs, which included dilation of the right pupil, nystagmoid movements of the eyeballs, increased reflexes in the legs, and disturbance of sensation, suggested either multiple or amyotrophic lateral sclerosis or an intramedullary spinal cord tumor. To exclude the latter, operation

was advised. Exploratory laminectomy in cases of advanced spinal cord lesions is as safe as an exploratory laparotomy in a parallel intra-abdominal condition. It is of little use to remove a spinal cord tumor in an advanced case when the patient is exhausted and debilitated.

A low cervical laminectomy was done with the patient prone, his shoulders at the edge of the table, and his head in the anæsthetist's lap. The dura was tense. When it was opened there was a gush of spinal fluid and the tumor came into view. The author considers it essential to have a clear view of a cord tumor in order to prevent damage to the cord in its removal. He believes that any surgeon who recognizes this necessity and the fact that any trauma to the cord causes permanent injury, and who has a good working knowledge of neurology is qualified to do spinal cord surgery. In the case reported Neuhof removed the arch and spine of the third cervical vertebra as well as of the fourth, fifth, and sixth so as to be able to see the cord beneath and to the right of the tumor.

As the tumor was found to be extramedullary, it was then possible to draw out both of its poles without damage. It was not stripped out from beneath the capsule because of the tendency to recurrence when this is done. The pedicle of the tumor attached to the cord and veins was cut after ligation of the veins with fine silk. To control the bleeding in the tortuous mass of veins a bit of muscle from the margin of the wound was held in place over the oozing area with the gloved finger; immediate hæmostasis resulted. The cord was found to be flattened and pushed forward and to the right. The dura was closed with fine silk, and the other layers with catgut. A posterior molded plaster-of-Paris splint to support the head and neck was then applied.

The tumor measured about 9 by 2 by 2.5 cm., and proved to be an endothelioma with cystic and hæmorrhagic degeneration.

The postoperative convalescence was uneventful. There was no change in the reflexes of the lower extremities, nor was catheterization necessary.

Rapid improvement followed the operation at first but the symptoms did not completely disappear. When compression has persisted for several months it is useless to expect complete recovery. In this case pain is gone, but slight atrophies and a slightly spastic gait with increased reflexes persist, and two years after the operation the patient is able to do only light work.

MARCUS H. HOBART, M.D.

Neuhof, H.: A Small Extramedullary Tumor at the First Dorsal Segment: Vague Localizing Signs: Advanced Paraplegia: Previous Operation at Another Level: Laminectomy and Removal of the Tumor: Course Uninfluenced by Operation. *Surg. Clin. N. Am.*, 1921, i, 1705.

The patient was a man 62 years of age who, for five years, had had weakness and stiffness of the legs and spasticity extending up the entire torso.

For two years he had had difficulty in urination and constipation, and occasional incontinence of the bowels. Following a mid-dorsal laminectomy done two years before, a flattened cord was found and a diagnosis of lateral sclerosis was made.

At frequent intervals agonizing contractions of the muscles of the back, chest, or lower extremities occurred. Disturbances of sensation developed, but were irregular and although a cord tumor was diagnosed, its location could not be determined for three months. At the end of that time an ill-defined belt of hyperalgesia referable to the third or fourth dorsal segment and a strip of diminished sensation in the right forearm and hand (first dorsal segment) were made out.

A laminectomy was done at the second and third dorsal vertebræ but only so-called "varicose veins of the cord" were found. The author does not believe that these cause trouble unless there is definite compression of the cord. A first dorsal laminectomy was therefore done, but not until the seventh cervical spinous process was removed was the lower end of the tumor exposed. When part of the sixth posterior arch was removed, a dense gray tumor measuring 1 by 1½ cm. and deeply embedded in the right lateral and anterior surfaces of the cord was seen. As only relief of the symptoms could be hoped for, the tumor was shelled out within the capsule by blunt dissection away from the cord. Bleeding was controlled by pressure. The depression showed no tendency to fill in. The wound was closed in layers. Microscopic

examination showed the tumor to be a psammoma. There was no improvement following the operation, and death occurred six weeks later, apparently as the result of pyelonephritis.

MARCUS H. HOBART, M.D.

Neuhof, H.: Endothelioma of the Conus and Cauda Equina: Difficulties in the Diagnosis: Laminectomy and Removal of the Tumor: Rapid Improvement with Return of the Reflexes. *Surg. Clin. N. Am.*, 1921, 1, 1687.

The author reports a case characterized by almost constant pain in the lower limbs; occasional incontinence of urine and feces; loss of power in the legs, more pronounced on the left side; spasticity; bilateral complete drop-foot; absence of the knee jerks; a decrease in the Achilles reflexes; a tendency to ankle clonus, more marked on the left side; and a bilateral Babinski phenomenon.

The X-ray showed marked spondylitis of the lower dorsal and lumbar vertebræ with well-developed osteophytes. Neuhof emphasizes the point that the X-ray demonstration of the results of arthritis of the vertebral column over an area believed to be the site of a tumor should not quiet the suspicion of a spinal cord tumor. At operation in the case reported a tumor was found whose capsule was attached to the roots of the cauda equina. After a difficult dissection it was removed with the exception of a narrow strip of capsule left attached to the roots of the cauda. The patient made an excellent recovery. FREDERICK CHRISTOPHER, M.D.

SURGERY OF THE NERVOUS SYSTEM

Ott, W. O.: The Treatment of Sciatica. *Minnesota Med.*, 1921, iv, 718.

The author discusses the treatment of sciatica by the removal of foci of infection and epidural injections of saline solution containing novocaine. His study included thirty-four cases treated at the Mayo Clinic since 1918. In the greater number of cases the condition is probably the result of an infectious process involving either the roots or the ganglia. Hypersensitiveness of the roots outside of the dura or of the ganglia was indicated by the fact that during the injection into the epidural space pain always occurred down the sciatic distribution on the affected side, but never on the well side. This pain was apparently due to pressure exerted by the fluid on the roots or ganglia as it was shown by laminectomy following the injection of methylene-blue into the epidural space of a fresh cadaver that the colored fluid came into contact only with the roots and the ganglia and did not pass beyond.

Of the thirty-four patients whose cases are reviewed, nine (27 per cent) were completely and permanently relieved, fourteen (40 per cent) were partially relieved, and eleven (33 per cent) apparently received no benefit whatever. Thirty-one

patients obtained temporary relief for two to fourteen days.

In some of the cases in which the condition was relieved foci of infection were demonstrated and removed, while in others no foci were demonstrated or removed.

Tees, F. J.: The Treatment of Peripheral Nerve Injuries. *Surg., Gynec. & Obst.*, 1921, xxxiii, 641.

The author states that he has an increasing belief in the ability of a damaged nerve to restore itself if given the opportunity. The importance of pre-operative care is emphasized: viz., massage and electrical treatment of paralyzed muscles to prevent degenerative changes, mobilization of joints fixed or apt to become fixed, and careful splinting to prevent the paralyzed muscles from becoming stretched by the constant pull of their antagonists.

Of a large number of war injuries to nerves observed by Tees only one in four was referred for operation. The great majority, including some which at first suggested complete interruption, recovered without interference. In the cases operated upon, fascial wraps were not used and, as far as possible, the suture line was left in its natural site, an intermuscular or subcutaneous plane.

Freeing is justifiable if it restores a nerve that is fairly uniform, soft, and supple, and especially if there is response to weak faradic stimulation. The absence of the latter, however, does not necessarily indicate resection and suture. The interstitial neuroma presents a special problem, and the de-

cision as to section must be based on the conditions of the particular case.

In the treatment of nerve injuries the dictum of Tinel that a good suture is far better than a poor liberation should be borne in mind.

FREDERICK CHRISTOPHER, M.D.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL DISORDERS

Sherk, H. H.: Epidermoid Cysts. *Surg., Gynec. & Obst.*, 1921, xxxiii, 494.

These cysts are seldom recognized by operators as pathologic entities. They are of frequent occurrence although until recent years the literature concerning them was rather scant. Some are undoubtedly traumatic in origin and many others are congenital. Their walls show some or all of the elements of the epiderm. They are differentiated from sebaceous cysts by the absence of an opening and the character of their contents. The pearly luster of their contents is one of their most noteworthy and constant characteristics. They contain no microorganisms. The absence of sebaceous cells and, almost invariably, of fats can generally be demonstrated by osmic acid stains. Their contents do not dissolve in ether. The skin overlying these cysts as a rule shows enlarged and dilated capillaries. Epidermoid cysts are not flattened like sebaceous cysts and, also unlike the latter, cannot be changed in shape.

JOHN D. ELLIS, M.D.

Wieting, J.: Wound Shock (Traumatic Shock) and the Conditions Caused by It After Injury (Ueber den Wundschlag (traumatischem Schock) und von ihm zuscheidende Zustände nach Verletzungen). *Ergebn. d. Chir. u. Orthop.*, 1921, xiv, 617.

There are two stages of wound shock. In the first, consciousness is maintained but speech is weak and husky. Commands are correctly understood, even though they are not always obeyed. The sensibility of the skin is diminished and protective motions are carried out tardily. The peripheral pulse is small but tense. The blood pressure is not lowered, but rather slightly raised, and the pulse sequence is rhythmical. The heart tones are less audible. The respiration is usually regular but shallow and often hardly perceptible. The axillary temperature is lowered. This first stage lasts only a few moments. It is then followed by recovery, death, or, as is usually the case, it changes to the second stage, the stage of collapse. This stage may last several hours or even days and may be followed by death resulting from increasing cardiac weakness or by slow recovery.

The stage of collapse as compared with the first stage shows the signs of relaxation of the vascular system. The blood pressure sinks. The sensory apparatus remains clear. Both stages of wound

shock vary considerably in their duration and severity. For this reason the first stage is frequently overlooked. In the final stage the entire pathologic picture is that of a severe vascular crisis.

The author reviews the historical development of the various theories regarding wound shock. Experimental studies on animals cannot explain this condition correctly as the external factors cannot be reproduced. The condition called "operative shock" is more like collapse. We can speak of operative shock only when a factor equivalent to an intensive trauma, such as high division of the sciatic nerve which exerts a powerful centripetal reflex effect, has played an important part. The danger of amputation of the thigh can be considerably diminished by blocking the sensory path by spinal analgesia.

The effect of cold upon the pleura may cause operative shock. The greater frequency of wound shock in the recent war as compared with former wars was due mainly to the larger ammunition used. In addition to the gross action of force, other factors also are effective, such as the effect upon the ear, the labyrinth, and the brain, changes in the air pressure, and the effect upon the psyche.

The author discusses in detail the processes occurring in the body during wound shock and its symptoms. He again emphasizes the fact that uncomplicated wound shock is essentially a vascular crisis produced through the sensory centripetal nerves and passing to the sympathetic system or even to the spinal cord through the sympathetic fibers. The clinical symptoms are explainable as a purely vasomotor syndrome. The period of relaxation is preceded by a more or less pronounced period of stimulation in which the blood pressure is slightly increased and the pulse is small and slightly retarded. The period of stimulation is soon followed by paralysis of the vasomotors or there may be marked lowering of their tonus and as a result a fall in the blood pressure and acceleration of the pulse. The temperature falls. There is never a true dyspnoea. Persistence of consciousness even in the most severe cases is pathognomonic of wound shock. Local wound shock, occurring only in individual parts of the body as a result of local concussion of the peripheral nerves, is an intermediate state and sometimes a state of transition to general wound shock. The collapse of wound shock is due to the vasomotor relaxation. Severe wound shock sets in immediately after the injury and is very often fatal.

There is no free interval between the injury and the symptoms.

The differential diagnosis between hæmorrhage and collapse, fatty embolism, tissue embolism, autotoxæmia, air embolism, infection, drug intoxication, concussion of the brain, syncope, and wound shock are discussed. When wound shock leads to death slowly, the moment at which the vital functions cease can be determined only with difficulty. If the shock is followed by recovery, it is preceded by a stage of erethrism.

There is no prophylaxis. Rest is the main requisite in the treatment. Fresh air, and if necessary, the artificial administration of oxygen are of considerable therapeutic value. The application of heat is a life-saving measure. Rapid equalizing of the distribution of the blood by lowering the head and the upper parts of the body has a good effect. The overloading of the heart by subcutaneous or intravenous infusion of physiological salt solution is not without danger. A better effect is obtained by means of repeated smaller intravenous infusions of 200 to 300 c. cm. of 0.9 per cent salt solution containing 30 drops of digipuratum and 20 drops of adrenalin at a temperature of 44 degrees. Pituitrin has a more lasting effect than adrenalin. In drug therapy, excitants are contraindicated during the stage of stimulation. If the vasomotor paralysis is pronounced, remedies stimulating the heart, especially strychnin, camphorated oil, caffeine, and alcohol, are indicated. No remedy should be used which will cause restlessness of a patient suffering from collapse.

Operation is an additional injury to the organism and is indicated only when there would be danger to life without it. In general, operation is done only after collapse has passed off. Chloroform should not be employed for the induction of anæsthesia. Wieting recommends lumbar analgesia and, if necessary, the use of ethyl chloride.

VON LOBMEYER (Z).

SERA, VACCINES, AND FERMENTS

Rosenow, E. C.: The Treatment of Poliomyelitis with Immune Horse Serum. *Minnesota Med.*, 1921, iv, 588.

The author reports the results of various physicians who treated, in all, 128 patients with poliomyelitis with his immune horse serum, chiefly during July, August, and September of 1918 and 1919.

There was a history of exposure in eleven cases. In ten instances there was more than one case in a family, and in forty-five there were other cases in the same community. Forty-one cases were sporadic. Abnormal conditions were found around the teeth in nine cases, infected and enlarged tonsils in thirty-seven, excessive adenoid tissue in twenty-two, and enlarged cervical glands in twenty-four.

Intravenous injections of the serum were given in eighty-eight cases, intramuscular injections in thirty-eight, intravenous and intramuscular injections in

twelve, and intraspinal and intramuscular injections in three. The total number of intravenous injections was 117, and the total number of intramuscular injections, 103. A spinal puncture was done in all cases preliminary to injection.

GROUP 1. Patients with no paralysis at the time of serum treatment. None of the twenty-three patients in this group died. One patient developed slight paralysis which later disappeared. Twenty-two patients showed an almost immediate beneficial effect of the serum, evidenced by lessening of the temperature, the pulse rate, and the stiffness and rigidity of the muscles of the neck and back, and by drowsiness. The average duration of the disease at the time of the first injection was 1.5 days, the average cell count in twelve cases was 105, the average age 5 years, the average total amount of serum 22 c.cm., and the average amount of spinal fluid withdrawn 9 c.cm.

GROUP 2. Patients with slight paralysis at the time of serum treatment. This group included twenty-seven patients. There were no deaths. All of the patients recovered except one. Twenty-five showed beneficial results of the serum at once, while in two cases in which the serum was given the third and fifth days of the disease, it appeared to have no effect. The average duration of the disease at the time of the first injection was 2.5 days, the average cell count in seventeen cases 69, the average age 6.7 years, the average total dosage 28 c.cm., and the average amount of spinal fluid withdrawn 18 c.cm.

GROUP 3. Patients with advanced paralysis at the time of serum treatment. Six of the seventy-eight patients in this group died. Nineteen recovered with residual paralysis; forty-one recovered completely. The late results in twelve cases are not known. Early good effects were noted in forty-four. Doubtful or no apparent effects were noted in nineteen. The average duration of the disease at the time of first injection was 6.3 days, the average cell count in thirty-nine cases 113, the average age 8.4 years, the average dosage 37 c.cm., and the average amount of spinal fluid withdrawn 37 c.cm.

Of the six patients who died, one received the first dose of serum on the third day, three on the fourth day, one on the sixth day, and one on the ninth day. Respiratory involvement was already present at the time of the first injection in four cases, complete paralysis of the extremities in one, and almost complete paralysis in one. The amount of serum varied from 5 to 130 c.cm.

The average time of treatment in the cases of patients who recovered was 4.6 days after the onset of symptoms, while in the cases of those who died it was ten days.

The mortality in the entire group was 4.7 per cent. Twenty patients showed residual paralysis; ninety-one had early benefit from the serum; twenty-one showed no good effect. The average duration of the disease at the time treatment was instituted was 4.6 days, the average cell count 102, the average age 7.4 years, and the average total

dosage 32 c.cm. The administration of serum usually caused a fall in the temperature. Following the injection of the serum one child had convulsions and one was delirious, but both recovered without paralysis.

The earlier the serum treatment was given the more prompt was the recovery. The outcome in the cases treated with serum with regard to the saving of life and restoration of muscle function is better than in those not so treated. Of seventy-two patients not treated, nineteen (25 per cent) died of respiratory paralysis, and fourteen had varying degrees of paralysis.

W. H. SPRUNT, M.D.

BLOOD

Martens, M.: The Ligation of Veins in Thrombophlebitic Pyæmia (Ueber Venenunterbindungen bei thrombophlebitischer Pyæmie). *Arch. f. klin. Chir.*, 1921, cxvi, 720.

At the 1921 Congress of Surgeons the author brought up the still disputed question of ligation of veins in thrombophlebitic pyæmia. The most important sites of suppurative thrombophlebitis are the transverse sinus in suppuration of the middle ear or from the jugular vein outward; the cavernous sinus in furuncle of the lip, erysipelas, empyema of the upper jaw and frontal sinuses, and suppuration of the orbits, inflammation of the jugular vein from the cavernous sinus outward, and occasionally inflammation of the tonsils; the portal vein in cholecystitis, appendicitis, hæmorrhoids, etc.; the vena cava and the common iliac and hypogastric veins in puerperal pyæmia; and the superficial or deep veins of the extremities in suppuration of the extremities.

The frequency of thrombophlebitic pyæmia has been markedly decreased by greater care with regard to antisepsis and earlier operation in cases of furuncle of the lip, appendicitis, cholecystitis, etc., and by more skillful treatment of accidental wounds. The prognosis of pyæmia is poor.

Treatment with drugs (antipyretics, preparations of silver, antistreptococcus serum, etc.) is quite useless. Ligation of the vein, on the other hand, improves the prognosis.

In discussing the history of ligation of veins the author states that Zeufal, in 1880, was the first to perform the operation in thrombosis of the transverse sinus. Martens has ligated the jugular vein in ten cases of this kind, in some of them secondarily when the fever did not fall after an operation on the antrum and opening of the sinus. Four of the patients died of previously existing meningitis, metastases in the lungs, or brain abscess. Heine has reported thirty-six cures in ninety sinus cases; in six the vein was ligated. Claus obtained a cure by operation in thirty of fifty-three sinus cases. Of twenty-six with involvement of the bulbous, he cured twelve by ligation and emptying of the jugular vein. Kissling states that following ligation of the vein a cure results in 75 per cent of the cases while

in cases not treated by ligation the cures average only 50 per cent.

Martens does not operate in thrombosis of the cavernous sinus. In pyæmia secondary to cholecystitis operation is impossible. In 1909 Wilms ligated the efferent veins in a case of appendicitis, and in 1913 Braun ligated the ileocolic vein successfully. Weil also obtained good results in one case. On the other hand, Sprengel, Martens, and Bruett operated without success. Trendelenburg in 1902 cured a case of puerperal pyæmia by ligating the hypogastric and ovarian veins, and another case in 1911 by ligating the vena cava and ovarian veins. The operation has since been performed frequently. Venus in 1911 collected 115 cases in which the mortality was 66 per cent. Veit succeeded in six cases out of twenty, Latko in ten out of twenty-eight, and Brumm in five.

The author, using the extraperitoneal method, has operated in eleven cases and cured seven. In two cases he ligated the vena cava and in the others one or both ovarian and hypogastric veins or the common iliac. In one case the left hypogastric and ovarian veins were ligated as thrombi were palpable in the left parametrium. The rigors, however, continued and there was pain in the right parametrium. Following ligation of the common iliac and ovarian veins three days later the rigors ceased and the temperature fell.

Early operation is necessary; in one case the author was unable to reach the end of the thrombus in the vena cava after four days. If the common iliac vein is ligated, it is wise to ligate the external iliac vein at the same time to guard against retrogressive continuance of the thrombus formation.

A number of surgeons have successfully undertaken ligation of the vein in thrombophlebitis of the extremities. The author made a futile exploration in four cases. Ligation of suppurated veins is advisable not only when the pyæmia is fully developed but when it is threatened; for example, ligation of the angular vein in furuncle of the lip, and of the saphenous vein in suppurated varicose veins, etc.

Prophylaxis is of great importance; hence suppurated organs (the gall-bladder and appendix), should be promptly removed, the mastoid process opened, furuncles of the lip, phlegmons, etc. should be incised, accidental wounds should be given proper treatment, amputation wounds in infectious processes should be left open, and the most careful asepsis should be observed in obstetrics and at operation. When pyæmia has become established, ligation of a vein or veins is imperative and should be done early.

SONNTAG (Z).

Unger, L. J.: The Deleterious Effect of Sodium Citrate Employed in Blood Transfusion. *J. Am. M. Ass.*, 1921, lxxvii, 2107.

Biologic tests demonstrate that the transfusion of unmodified blood is of far greater value than the transfusion of blood modified by the addition of sodium citrate.

Sodium citrate, even in the low percentage employed in a citrate transfusion, affects the red blood cells, making them more fragile. The value of such blood to a patient suffering from a hæmolytic disease, such as pernicious anæmia, is lessened to that extent.

Sodium citrate diminishes the available quantity of complement in two ways: by its direct action on the complement itself, and by introducing into the plasma an anticomplementary substance which inactivates complement. This substance is derived directly from red blood cells.

Sodium citrate also reduces almost to nil the function of opsonins, and practically destroys the phagocytic power of the white blood cells. The phagocytic index of the blood of various donors varies. Since complement and the phagocytic power are of prime importance in the protective action against pathogenic organisms, unmodified blood from a donor with a high phagocytic index should be employed when an attempt is made to combat local or general infections by means of transfusions.

In the selection of a donor, therefore, attention should be paid to the finer qualitative differences in the blood.

SAMUEL KAHN, M.D.

GENERAL BACTERIAL INFECTIONS

Hektoen, L.: Old and New Knowledge of Immunity.
J. Am. M. Ass., 1921, lxxvii, 1935.

The history of immunology may be divided into the premicrobic period ending about 1880, and the microbic or modern period, from 1880 down to the present day. To the premicrobic period belong the attempts to produce immunity to the bites of venomous snakes by early savage peoples, King Mithridate's legendary method of producing a universal antidote for poisons, early Chinese and Turkish methods of actively immunizing against smallpox, Sydenham's conception of specific remedies for all important diseases, Thomas Fuller's early statements as to the specificity of the immunity characteristics of infectious diseases, early experimentation with measles and with pest, Jenner's cowpox studies, and the isopathy of Lux. The author sketches the development of nosography in the early part of the nineteenth century.

The microbic or modern period began with the demonstration by Pasteur that specific immunity may be produced by the injection of the demonstrated agents of infectious diseases which have been artificially attenuated or changed. Two chief forms of immunity are now recognized: (1) the antitoxic, and (2) the antimicrobial. It has been found that immune reactions are not limited to infectious agents and their products, but may be set up by a variety of protein substances. Such proteins are termed "antigens." An individual once thoroughly influenced by the entrance of an antigen into his body becomes changed, and this change may manifest itself by: (1) the persistence of an excess of free

antibodies in the blood, (2) an increased rate of antibody formation on re-entrance of the same antigen, (3) anaphylactic reactions on re-introduction of the antigen, or (4) an atypical course of a re-infection. Antigen-antibody reactions may play a part in the production of certain non-infectious diseases or syndromes such as hay fever and serum disease.

The author reviews the development of our present knowledge regarding the various members of the streptococcus group of organisms and the discussions regarding their specificity.

J. D. ELLIS, M. D.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Deaver, J. B.: Old Methods Versus New in Surgical Diagnosis. *Surg., Gynec. & Obst.*, 1921, xxxiii, 605.

In assuming the office of President of the Clinical Congress of the American College of Surgeons, Deaver sounded a warning against the acceptance of new methods and new remedies unless they can stand the acid test of experience. The radium treatment for cancer has fallen far short of being a universal cure and, indeed, in many situations where help is most needed it has proved sadly lacking.

He stated further that there seems to be a danger of under-estimating the value of the old and tried methods of clinical diagnosis by sight, touch, and hearing, and of regarding the findings so acquired as less scientific than those obtained through the medium of a piece of apparatus or a reaction in a test tube. All data must be submitted to interpretation before judgement is possible, and data gained directly by questioning and by the older methods of examination have exactly the same scientific status as those secured by indirect methods.

We must therefore see to it that while the boundaries of knowledge are being extended and while we are placing new tools in the hands of the younger generation, the older arts which are the chief reliance of the diagnostician receive proper emphasis.

H. A. MCKNIGHT, M. D.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Nañagas, J. C.: Experimental Studies on Hydrocephalus. *Bull. Johns Hopkins Hosp.*, 1921, xxxii, 381.

Nañagas found that the pressure of the cerebrospinal fluid in kittens in which an internal hydrocephalus had been produced experimentally was considerably higher than that of normal kittens, the average difference being 50 mm. of cerebrospinal fluid.

The intravenous injection of a strongly hypertonic solution of sodium chloride into hydrocephalic animals produced a brief initial rise in the pressure of the intraventricular cerebrospinal fluid which was followed immediately by a marked depression. The

decrease in pressure at times produced negative values. This phenomenon is probably to be explained by the apparently rapid absorption of the cerebrospinal fluid from the dilated cerebral ventricles.

The intravenous injection of hypotonic solution (distilled water) into hydrocephalic kittens was invariably followed by a marked and sustained increase in the pressure of the cerebrospinal fluid. This result was due possibly to a rapid elaboration of fluid by the choroid plexus or an increased transudation of fluid through the ventricular walls.

Intraventricular absorption of cerebrospinal fluid occurred in the hydrocephalic kittens; the pathway of escape was through the ependyma into the underlying capillary network. The absorption was hastened by the intravenous administration of strongly hypertonic solutions.

The absorption of the cerebrospinal fluid was similarly found to occur through the ventricular ependyma in normal kittens. The pathway of escape was the same as in the hydrocephalic kittens; the process was very slow in the normal animal but was hastened by the administration of hypertonic solutions. The physiological significance of this intraventricular absorption in the normal animal is probably slight.

The choroid plexus took absolutely no part in the intraventricular absorption of the cerebrospinal fluid.

H. A. MCKNIGHT, M. D.

Mann, F. C.: A Technique for Making a Biliary Fistula. *J. Lab. & Clin. Med.*, 1921, vii, 84.

Of the many methods described for making biliary fistulae one of the following procedures has generally been employed: (1) suturing the gall-bladder to the abdominal wall and opening it so that the bile drains to the exterior; (2) suturing a cannula or tube in the gall-bladder; (3) excising the common duct at the point of entrance to the duodenum with a piece of duodenal wall and suturing it to the skin; and (4) placing a cannula in the common bile duct. These procedures, however, are not satisfactory because the blood supply to the transplanted part is insufficient or because of infection of the viscus.

The essentials of technique described by the author are definite fixation of the common duct in a superficial position and drainage of the duct to the exterior. A midline or right rectus incision is made and carried as far forward as possible without opening the pleural cavity. The pylorus and first portion of the duodenum are pulled up into the wound. A small opening through the mesentery of the duodenum is made about 4 cm. on each side of the point of entrance of the common duct into the duodenum and between the duodenal wall and the pancreas. Through these openings the peritoneum and then the fascia are sutured with double No. 2 chromic catgut. This procedure leaves the duct-bearing portion of the duodenum just under the skin. The superficial fascia and skin are then sutured over the transposed loop of intestine. Care must be

taken not to cause obstruction by suturing too close to the ends of the loop.

After complete healing (seven to fourteen days), a small incision is made over the transposed loop of intestine at the point where the common duct is located, and the duct is exposed, ligated, and opened so that it will drain at its point of emergence from the skin. A soft rubber catheter is kept in the duct for a day or two after the operation. Observations may then be begun. By simply passing a catheter into the opened end of the duct, observations may be made of the secretory activity of the liver, the secretory pressure of the organ, or the movements of the gall-bladder.

Mann has made observations over a period of six months, during which time the animals maintained an apparently normal condition. However, as bile seems to be essential to life, the condition of all animals with biliary fistulae sooner or later becomes serious. Occasional catheterization of the duct will prevent cicatrization. CLAYTON F. ANDREWS, M.D.

ROENTGENOLOGY AND RADIUM THERAPY

Soiland, A.: Radiation in the Treatment of Leukæmia. *J. Radiol.*, 1921, ii, 25.

After reviewing the different measures introduced and used in the past decade in the treatment of the various types of leukæmia, the author is convinced that radiation by the roentgen rays and radium has proved to be the most serviceable from the standpoint of symptoms. From the standpoint of cure no permanent foundation on which definite claims may be based has been established to date. Frequently an enlarged spleen may be reduced to normal in a short time, and in some cases of the Hodgkin type, glands of enormous size may be reduced with almost unbelievable rapidity by radiotherapy. Unfortunately, the test of time has shown that these immediate results are neither permanent nor curative. In spite of subsequent radiation, there is a gradual enlargement of the affected organs and glands and eventually there will come a time when radiation fails to prevent a fatal termination.

The technique varies necessarily with the symptoms of the particular case. The aim should be to diminish the pathologic activity of an accentuated leucocyte count as rapidly as possible. In doing this, however, it is of the utmost importance to watch the behavior of the red blood corpuscles and the hæmoglobin. Radiation may be easily carried to the point at which the red corpuscles are destroyed and the hæmoglobin percentage is lowered, changes which are more harmful than the presence of a fairly large white cell count.

The effects of radiation by the roentgen rays and radium are apparently alike. If radium is used, a sufficient amount must be employed to insure deep effects. The author frequently employs radium over the spleen and roentgen radiation over the osseous structures and glandular fields. It is of the

utmost importance to radiate the inguinal and axillary regions thoroughly whether or not any palpable gland chains are present. The methods of applying the radium and roentgen rays are described in detail. The course of the treatment is determined in large measure by frequent blood examinations.

An important phase of the subject is the possible correlation between lymphatic leukæmia and adenocarcinoma. In some of these conditions the blood picture may be so atypical as to challenge the best diagnostic skill. A condition diagnosed at the outset as typical Hodgkin's disease may develop rapidly into a condition bearing every clinical resemblance to a sarcoma of high malignancy. Age seems to have considerable bearing on the effect of radiation. The earlier in life leukæmia develops, the more rapidly it causes death. In patients of advanced years radiation seems to maintain a retarding influence on the progress of the disease.

ADOLPH HARTUNG, M. D.

Van Allen, H. W.: A Retrospective Note Covering the Treatment of Tonsillitis by the X-Ray. *J. Radiol.*, 1921, ii, 18.

In an attempt to ascertain the permanency of the beneficial results obtainable by roentgen treatment of enlarged tonsils, the author checked up about fifty cases which he treated three or more years ago for cervical adenitis following repeated attacks of tonsillitis with chronic enlargement. The results of this investigation showed the beneficial effect upon the tonsils very definitely. About 80 per cent of the patients had had no further attacks of tonsillitis and the tonsils had ceased to annoy, having been greatly reduced in size. In the rest of the cases there had been only acute inflammations after the radiations.

By chance, the method of treatment corresponds quite closely to that recommended by Witherbee. It was always fractional, but the dose varied. Probably in those early days when methods of exact measurement were not known it was much less than is given today. As instruments of precision came into use, an 8-in. spark gap, a 3-mm. aluminum filter, $3\frac{1}{2}$ ma. of current, a 16-in. distance, and twenty minutes of time were employed, and the treatment was repeated once a week for about six weeks.

From this study of his cases the author concludes that the percentage of permanent cures was greater in the early days than later when more active treatment was given. None of his patients developed telangiectasis or skin atrophy, but he has noted these conditions in patients who received more vigorous radiation.

ADOLPH HARTUNG, M.D.

Bowing, H. H.: The Value of Radium and X-Ray Therapy in Hodgkin's Disease. *J. Radiol.*, 1921, ii, 20.

The author discusses the primary results obtained at the Mayo Clinic by the use of radium and X-ray therapy in Hodgkin's disease. Reduction in the glandular enlargement and amelioration of symptoms were noted in practically all cases.

The etiology of Hodgkin's disease is unknown. By some authorities focal infection is believed to be a factor. The disease is characterized pathologically by enlargement of all the lymphoid tissues of the body. In the majority of cases the primary lesion is in the cervical glands on one side and spreads to the opposite side with extension to the axillary and inguinal glands and finally to the deep glands of the mediastinum and abdomen. The microscopic picture shows proliferation of large endothelioid cells, numerous multinuclear giant cells, progressive fibrosis, and an abundance of eosinophile cells.

The clinical course of the disease is either acute or chronic. The acute condition is rapidly progressive and terminates fatally in a few months. The chronic condition may last two to five years or longer.

In the differential diagnosis, lymphosarcoma, tuberculous adenitis, and pseudoleukæmia must be considered.

Radium treatment as used at the Mayo Clinic consists in the application of from 5,000 to 6,000 mg.-hrs. of radium to each right and left cervical and supraclavicular area, from 2,000 to 3,000 to the infraclavicular and inguinal regions, and from 1,000 to 3,000 to the axillary areas. Severe reactions are treated by catharsis and the administration of sodium bicarbonate. Two to four areas measuring 2 by 4 cm. are usually radiated at one time with an interval of two to three days between the treatments.

The present formula for X-ray treatments at the Mayo Clinic is: a broad-focus Coolidge tube, a 23.7-cm. parallel spark gap, skin target 30.5 cm. distance, time twelve minutes, 5 ma. of current, filtration by 6 mm. of aluminum, and a piece of sole leather. The different gland areas, the mediastinum, and the abdomen are exposed successively. The treatments are repeated every three weeks until six or eight have been given. An interval of three months is then allowed to determine whether or not further therapy is indicated. X-ray treatments are usually given at the beginning or end of radium exposures.

The initial good results of radium and X-ray treatment may be due to direct destructive effects on the glandular elements. The large glandular endothelial cells are very susceptible to radiation. Radium and the X-ray set up fibrosis.

Bowing concludes that "the life expectancy of the patient should be increased by intensive radium treatment of the superficial glandular enlargements and deep X-ray therapy of the thoracic and abdominal cavities whether or not the roentgenograms are positive. Huge glandular enlargement and mediastinal involvement are markedly diminished. The generalized pruritis may diminish, and in some cases may entirely disappear."

L. H. FOWLER, M. D.

Quick, D.: Radium in the Treatment of Epithelioma of the Lip. *J. Radiol.*, 1921, ii, 1.

The possibilities for radium therapy and diagnosis are probably greater in cases of epidermoid carci-

noma of the lip than in any other field. The diagnosis should be based on the clinical findings; the author warns against biopsy and manipulation of the lesion.

A typical epithelioma of the lip is an epidermoid or squamous-celled carcinoma. Basal-celled carcinoma attacks the lip only by extension from the skin. There are two types of lesion: (1) the superficial papillary type which forms crusts, extends directly, and metastasizes late only after deep infiltration; and (2) the deeply infiltrating type which is small, has raised indurated edges, metastasizes early, and is more malignant than Type 1.

The author quotes statistics regarding the operative results and states as a conclusion that 70 per cent of clinical cures for the five-year period is a fair average. His discussion of the surgical procedure brings out the disadvantage of scarring and tissue loss when block dissection of the neck is done. Block dissection is not necessary when there is no demonstrable tumor. Cases may be classified into those in which the lesion is apt to form metastases and those in which it is probable that it will not do so. For the latter, expectant treatment is advised; operation should be delayed until the appearance of glands. Before rupture of the capsule and infiltration of the surrounding tissues the glands are protective and should be dealt with intelligently. The plan used at the Memorial Institute is given as follows:

The primary lesion is treated with radium only. From 60 to 65 mc.-hrs. of emanation are applied per square centimeter of surface, screened with 0.5 mm. of silver, at a distance of 4 mm. from the lesion for even distribution of the rays. The radium is applied on three sides of the lesion and held in a cast of the lip and lesion made previously. The tubes are embedded in the molding compound cast by gouging grooves with a hot gouge after the cast has been fitted. The tubes are held in place by pouring melted paraffin over them after placing them in the grooves. All lesions are thus treated and usually one treatment is sufficient. In cases of deep infiltration, emanation is used also. One millicurie of emanation gives 132 mc.-hrs. before decay. The emanation is inserted interstitially by means of a special trocar after the induction of novocaine anæsthesia and after a surface irradiation has been given in order that the possibility of metastasis due to the trauma may be lessened.

The neck is always irradiated, in favorable cases with radium and in the others with either radium or the X-ray or both. The object is to stimulate the protective forces in the lymphatics and to destroy microscopic metastasis. When nodes are present the object is to make the case a better operative risk. No claim is made that the metastatic cancer cells in nodes are fully destroyed by radiation alone. Surgery is contra-indicated unless definite cancer nodules are felt. Nodes other than cancer nodes are protective and a barrier to further dissemination. Block dissection is destructive to protection and even stimulates the growth unless every node is removed.

If nodes are not clinically malignant, they are treated by irradiation. When clinically malignant nodes are present, block dissection is followed by the burying of emanation along the involved chains of lymphatics at the time of operation. The wound heals before the reaction from the radium sets in. If the capsule of the node is broken and infiltration has occurred, the emanation is buried at the time of the incision without dissection of the mass. Local anæsthesia is advised.

The author gives his own statistics based on 162 cases. The total number of patients traced is 115. Of these, eighty (69.5 per cent) are alive and free from the disease. The average period of freedom from disease is eighteen months. Twenty-eight are dead and eight are steadily growing worse. Of twenty-two who had dissections of the neck, fifteen are clinically free from the disease, the average time being eighteen months. Six died and one is steadily getting worse. In ninety-two cases the condition was primary and no nodes were found. Sixty-seven (72.8 per cent) are clinically well. Nine later developed nodes and had a block dissection. Eight of these are clinically well, one died two months after operation, and three died of intercurrent disease but at the time of death were free from malignancy.

A. J. LARKIN, M.D.

Pfahler, G. E.: Radium Combined with X-Ray Treatment of Carcinoma of the Breast. *Am. J. Roentgenol.*, 1921, n. s. viii, 661.

The treatment of carcinoma of the breast by radiation is in principle the same as that of malignant disease elsewhere in the body. Successful results are dependent upon: (1) a clear recognition of the extent and nature of the disease, and (2) the most thorough and skillful application of the radiation to every portion of the involved area for a sufficient length of time and with sufficient intensity.

For the past six years Pfahler has recommended an ante-operative course of X-ray treatment including the breast, the axilla, and the supraclavicular region and carrying as much radiation as possible into the tissues within a period of one or two weeks. The object of this is to so devitalize the malignant cells that they cannot easily reproduce themselves either in the wound or in other locations if transplanted by the lymph or blood channels during the operation. This treatment should be followed by an operation as radical and complete as if no preliminary radiation had been given. Following the operation and within a period of three or four weeks after the preliminary treatment a subsequent period of radiation should be given with saturation of the tissues to the limit of skin tolerance. In an early or average case the whole process should be complete within two months. If the disease is extensive and there is metastasis, more radiation must be given over a longer period of time and the outlook is less hopeful.

Pfahler uses the following technique: At least three areas are treated: (1) the mammary region,

(2) the supraclavicular region, and (3), the scapular and posterior axillary region. The radiation is done with a Coolidge tube, a 6-mm. glass or aluminum filter, a 9-in. parallel spark gap, and 5 ma. of current. When the focal skin distance is 30 cm. the time is twenty minutes, and when the focal skin distance is 40 cm. the time is thirty-five minutes. Each of the three areas is covered in this manner twice within a period of two weeks. The longer technique is preferred but seems to increase the radiation sickness. Therefore the shorter technique is frequently chosen. By means of two applications within a period of two weeks an amount which in one application would cause a serious erythema may be given safely.

In the treatment of primary carcinoma of the breast by radiation alone the preliminary X-ray dosage technique is the same as in the ante-operative radiation already described. At the end of two weeks, radium needles (10 mgm. each) are inserted throughout the palpable lesions, 0.5 cm. apart if they are to remain eight hours, and 2 cm. apart if they are to remain sixteen hours. In order that no part may recover or develop a resistance to the rays while some other part is being treated, the needles must be inserted under aseptic conditions and into every portion of the neoplasm either in a single application or in more than one application within a period of one week.

After a detailed account of six cases Pfahler summarizes his conclusions as follows:

Radiologists should study carcinoma of the breast and its treatment with the same thoroughness as the surgeon.

The best procedure for the treatment of primary carcinoma of the breast will probably consist of ante-operative X-ray treatment followed promptly by operation and again promptly by postoperative X-ray treatment.

For inoperable primary carcinoma of the breast treatment by X-ray and radium offers a reasonable hope of success if it is skillfully and thoroughly given. The earlier it is applied the better will be the result.

Recurrent and metastatic carcinoma from carcinoma of the breast can frequently be made to disappear completely by skillful X-ray or radium therapy but probably better by a combination of both, and success can be hoped for providing the disease is localized to the area treated.

All patients should be kept under observation and requested to report for examination at increasing intervals for an indefinite time.

D. R. BOWEN, M.D.

LEGAL MEDICINE

A Childbirth Case—Error in Referring to Pus.
Schnetzky vs. Zanto (Wis.), 182 N. W. R., p. 751.

March 5, 1919, while attending the defendant, the plaintiff was employed to take care of the defendant's wife who was delivered of a child the same evening.

On March 9 he detected symptoms of pneumonia in the wife, and on March 10 began a course of treatment for this condition which he continued until March 13. During this time he did not treat the patient for any other ailment. On March 13, the plaintiff was discharged and a Dr. Berwick was called.

When the plaintiff sued the defendant for the medical services which he had rendered the defendant and his wife, the defendant counterclaimed for damages on account of the plaintiff's negligence in treating his wife. Dr. Berwick testified that at his first visit he found the defendant's wife suffering from septicæmia with a very high temperature; that the source of such trouble was in the uterus; that the condition of the uterus was such that it was dangerous to attempt to clean it out; that on March 13 the patient did not have pneumonia and there were no indications that she had recently been so afflicted; that four days afterward the witness flushed and cleared out the uterus; that in the strongly odorous fluid discharge he found a portion of the placenta about the size of a pigeon's egg; and that the critical condition in which he found the patient was the direct and probable result of the failure to remove such portion of the placenta.

Dr. Berwick also testified that at the time of the discharge from the uterus there was no pus, and there was no testimony in the record which tended to qualify or contradict this statement. Nevertheless, a hypothetical question was put to one of the medical experts which included the finding of such a piece of placenta eleven days after the birth of a child, the discharge from the uterus of half a pint of blood and pus, and a temperature that rose from 104 to 106 degrees F. during the period of five to seventeen days after the birth. Moreover, the presence of pus was made a part of the hypothetical questions by the defendant's counsel in his examination of all the medical experts save one.

The plaintiff testified that he examined the after-birth and found it intact. He was corroborated on both of these points by the midwife in attendance, and on the first by the defendant. The trial resulted in a verdict and judgment for the defendant. This judgment was reversed and the cause remanded for a new trial because, although Dr. Berwick testified directly that there was no pus in the discharge in which he claimed he found a portion of the placenta, it was quite apparent that, through a mistake which could easily arise in the trial of such a lawsuit, the court and counsel on both sides had assumed that there was testimony warranting the inclusion of the presence of pus in such a discharge as an important part of the hypothetical question asked of the medical witnesses.

A consideration of the entire testimony satisfied the supreme court that the reiterated inclusion of and emphasis on the presence of pus in the discharge must have influenced the jury in a substantial degree in arriving at the verdict it rendered.

J. A. CASTAGNINO.

Pregnancy Diagnosed as Tumor After Ovariectomy.

Gottschall vs. Geiger (Mo.), 231 S.W.R., p. 87.

The gist of the cause of action submitted was that the defendant was negligent in diagnosing the plaintiff's condition and in advising and undertaking a surgical operation. When the abdomen was opened it was found that pregnancy, and not a tumor, was the cause of trouble.

One of the matters in dispute was whether the defendant was negligent in assuming that the plaintiff was not pregnant since, although about nine months previously he had removed her ovaries, he knew that he had left a small portion of one of them, and knew, or should have known, as a medical man, that it was not impossible for her to become pregnant. The burden was on the plaintiff to show, not only that the defendant made a mistake in diagnosing her condition and deciding on and advising an operation, but also that this was a negligent mistake and that the operation was so palpably unnecessary that a surgeon of ordinary care and prudence would not have advised or undertaken it.

If conditions were such as to lead a surgeon of ordinary care and skill to think that the plaintiff was not pregnant, or even that as a remote possibility she might be, and yet an operation was necessary and the defendant in the honest exercise of his best

judgment thought an operation was proper, then the defendant would not be liable, even though it afterward turned out that the defendant was mistaken in diagnosing the plaintiff's condition. If there were conditions such as to raise a question whether an operation was advisable or proper, then the question of whether the defendant's decision to operate was negligent or not should be gathered from the opinions and testimony of those who had special knowledge and were qualified to speak on such matters. The mere fact that the plaintiff became pregnant notwithstanding that she had only a small portion of one ovary did not, of itself, show that her pregnancy was abnormal, i. e., that abnormal conditions were associated with that pregnancy.

The jury returned a verdict in her favor for \$3,000 damages, but this judgment was reversed and the cause remanded for a new trial on account of error in the admission of the testimony of the plaintiff's husband who was present at the operation as a silent spectator and not as the plaintiff's agent. Under the Missouri statute a husband can testify as a witness in his wife's lawsuit only when the transaction constituting the basis of the action is one "had with or conducted by" the husband as her agent.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Culbertson, C.: The Disposition of the Uterus Following Salpingectomy Where It Is Desirable to Preserve Menstruation. *Am. J. Obst. & Gynec.*, 1921, ii, 497.

The author reviews 518 cases of general pelvic peritonitis involving the tubes which were treated by abdominal section. Both tubes were removed in 445 cases; one tube was removed in 52 cases; and both tubes were left in the remaining 21 cases. In the 445 cases in which both tubes were removed hysterectomy was performed 199 times, leaving 246 cases (55 per cent) in which some disposition of the uterus *in situ* was necessary.

In such cases there are four possibilities. First, the uterus may be left alone. This is rarely practicable as it is often already displaced, either as a result of the disease condition for which the operation was performed or as the result of some other pre-existing factor.

The second possibility consists in some method of round-ligament shortening. It has long been the author's opinion that this procedure should be reserved for cases in which pregnancy is to take place in the future.

The third possibility consists of ventral fixation. This method is probably the one most generally employed in the surgical clinics of the United States. However, it forms a pillar in the lower mid-abdomen, renders peritonization difficult or impossible, and like the other two methods, requires the retention of the entire uterus except the portion of the cervix which may have been dealt with by a plastic operation. It is safe to say that secondary operations for removal of the uterus more often follow ventral fixation than any of the other procedures.

The fourth possibility consists in the removal of the entire fundus of the uterus, a procedure which leaves a small organ that can be entirely covered by peritonization, that remains in its normal position and is capable of maintaining menstruation to a degree sufficient to satisfy the physiological and psychological requirements, and that is not subject to subsequent excessive bleeding.

In all respects this treatment of the uterus is similar to Bell's "acro-hystero-salpingectomy" except in the method of peritonization which requires freeing of the round ligaments. In the author's opinion, imbrication of the round ligaments and approximation of the broad ligaments from side to side over the uterus is superior to the method described by Buettner. He believes that in order to secure the advantages set forth by Bell and Polak more of the fundus must be removed than is possible unless the round ligaments are freed.

If the uterus has been in retroversion and the cervix continues to swing too far forward, shortening of the uterosacral ligaments is carried out as is done in association with round-ligament shortening for simple uterine retroversion.

While fixation of the uterus into the abdominal wall was used in the early years, this procedure has been virtually abandoned in favor of the operation of defundation. Patients operated upon as long ago as 1913 are still menstruating. There has been little or no dysmenorrhœa complained of, and in not one instance has the follow-up revealed a premature menopause or a continuance of excessive uterine bleeding. On the contrary, the menses are scanty in amount and their duration from one to three days. In some cases the problem of leucorrhœa remains, but this will never be overcome as long as the cervix remains.

E. L. CORNELL, M.D.

Shaw, W. F.: The Present Position of the Treatment of Carcinoma of the Cervix. *Brit. M. J.* 1921, ii, 1101.

The importance of the early recognition of carcinoma is generally understood. If a careful bi-manual examination were made of all women near or past the menopause who have a history of bleeding other than that of normal menstruation many early cases would be found. Cases too far advanced for the radical Wertheim hysterectomy have been treated with radium but the author has seen only one so treated in which improvement lasted more than one year. When these cases are examined two months after radium treatment the cervix is smooth with scar tissue but recurrence is the rule.

In one far-advanced case in which examination several months after treatment with radium showed an apparently operable condition, Shaw performed a Wertheim hysterectomy but it was done with great difficulty because of the dense adhesions in which the ureters were embedded. At present it is his practice to give a radium application one week before operation, as the tissues do not become sclerosed in that period. In this way the patient has the benefit of both treatments and the difficulties of operation are not increased.

I. E. BISHKOW, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Curtis, A. H.: The Bacteriology and Pathology of Fallopian Tubes Removed at Operation. *Surg., Gynec. & Obst.*, 1921, xxxiii, 621.

This article reports the study of fallopian tubes from nearly three hundred patients. One hundred and ninety-two were subjected to most painstaking bacteriological and histological examinations.

From the clinical history, examination of the external genitalia, evidence obtained at operation, and laboratory study of the tubes, it was found that gonococcal infection was responsible for the pathologic changes in over 70 per cent of the cases. Approximately 10 per cent more were thought to have been primarily infected with the gonococcus, but this could not be determined with certainty. In somewhat more than 15 per cent the tubal pathology appeared to have been due entirely to other pus-producing bacteria, notably various types of streptococci.

Tuberculous tubes were found in the absence of generalized tuberculous peritonitis in 5 per cent of the cases.

Bacillus coli is particularly common in tubo-ovarian abscesses of large size. As a primary cause of salpingitis neither the colon bacillus nor the staphylococcus appears to be of much importance.

It has seldom been possible to obtain gonococci in cultures from thoroughly ground fallopian tubes removed from patients free from fever and leucocytosis for a period of more than ten days or two weeks. Therefore it appears that the fallopian tube is not a focus for chronic gonorrhœal infection. Persistently active gonorrhœa of the tubes is evidently ascribable either to recurrence of infection from without or repeated invasion of bacteria from the chronically infected lower genital tract.

Tubal infection due to various types of streptococci yielded pathologic evidence of an active inflammatory process long after the introduction of the bacteria, and streptococci were occasionally isolated many months, or even years, after the acute process had subsided.

Gonorrhœal pelvic infection primarily involves the tubes and results in thickening, induration, closure of the fimbriated ends, and the formation of pelvic adhesions. The latter may be separated by blunt dissection. Microscopic examination shows adhesion of the folds of the mucosa, pockets of gland-like columnar epithelium extending deeply into the wall of the tube, numerous blood vessels, and plasma cells.

A single attack of gonorrhœal salpingitis is usually without protracted clinical symptoms or severe pathologic results. Greatly thickened tubes are usually due to repeated exposures.

Implicit reliance is not to be placed upon hæmatosalpinx as evidence of tubal gestation as hæmorrhage may occur in greatly thickened gonorrhœal tubes.

Salpingitis nodosa, although generally of gonorrhœal origin, may result from numerous causes, inflammatory or non-inflammatory; the etiology of a doubtful case is best explained by microscopic examination.

In streptococcus infection tubal involvement is usually only a part of the picture. Perisalpingitis is the most common type of tubal lesion. Even when there is an extensive salpingitis, the fimbriated extremities will probably remain open; the mucous

membrane folds or "villi" of such tubes show few adhesions. On the other hand, the less common case with occlusion of the fimbriæ and an accumulation of fluid in the tube shows adhesions between the villi and nests of columnar cells in the tube wall; differentiation from the gonorrhœal tube is then difficult.

Tuberculosis is very apt to be overlooked if routine histologic preparations are not made. When the condition is limited to the pelvic organs it is difficult to establish a diagnosis from the gross appearance alone. Unusually resistant adhesions suggest tuberculous or streptococcus infection.

Somewhat similar operative measures appear indicated in streptococcus and tuberculous salpingitis. In both diseases the infection is usually not confined to the tubes; in both, viable bacteria are often still present in the tissues at the time of operation and there is danger of chronic postoperative infection of the ovaries. Particularly as regards extirpation of the ovaries, more radical surgery appears indicated than in gonorrhœal infections of corresponding severity.

E. L. CORNELL, M. D.

EXTERNAL GENITALIA

Schroeder, R., and Kuhlmann, E. A.: *Ulcerations of the Vagina, with a Report of One Case Each of So-Called Round and Varicose Ulcer of the Vagina* (Die Ulcerationen der Vagina. Zugleich Mitteilung ueber je einen Fall von sog. Ulcus rotundum und Ulcus varicosum vaginae). *Arch. f. Gynaek.*, 1921, CXV, 145.

Ulcers caused by foreign bodies, prolapse, simple necrosis, and gangrene are not considered in this article.

GROUP 1. Round ulcers. The round ulcer has been described in the literature fourteen times. In most cases it was single, and its identification was not always positive. In the fifteenth case, here reported, the ulcer was regarded as one of the group of round ulcers because no specific change could be made out by microscopic examination. It was a not quite circular lesion with a sharp margin situated close behind the posterior commissure. Its base, about 2 mm. deep in the center, was somewhat contracted but was movable over the underlying tissues. There was no zone of inflammation; only slight thickening of the surrounding parts. The base of the ulcer was slightly moist and had a yellowish, amyloid, glassy appearance.

GROUP 2. Phagedenic and aphthous ulcers. Of the first variety only four cases already described (Vautrin, Hammernick) are considered here. The ulcer is irregular in form and has thickened, hard margins. The marked destruction of the tissue of the cervix, portio, and vagina, and the fatal hæmorrhages prove that the lesion is not to be included among the round ulcers. On the contrary it is related to the aphthous ulcer. Three cases of the latter (Neumann, Oppenheim) are described. The lesions are irregular, smooth, grayish-yellow plaques

developing simultaneously in the portio and vagina. Accompanied by a necrotic angina of aphthous stomatitis, they appear with local red zones and general phenomena of fever after irruption of herpes vesicles and show histologically a necrosing inflammation.

GROUP 3. Tuberculous ulcers. The authors have collected fifty-six cases. These ulcers are of three types: (1) primary, (2) secondary without simultaneous disease of the genital organs, and (3) secondary with simultaneous disease of the genital organs. To Type 1 belongs only the one much disputed case of Friedlaender, in which a small tuberculous ulceration was found on the portio vaginalis, around the external uterine os, in an otherwise normal woman who had died of apoplexy; microscopically this ulceration showed a large number of tubercles with giant cells. To Type 2 belong six cases in which the ulcer was developed by the hæmatogenous and lymphogenous routes or by the transference of saliva from other tuberculous foci. The majority of the cases belong to Type 3 and are divided into: (1) those with ulcerations only; (2) those with ulcerations and tubercles; (3) those in which the findings are doubtful. Thirty-seven cases of uncomplicated ulcerations are described, nine cases of ulceration and tubercles, and one case in which the findings were doubtful. The various means by which infection may take place are discussed and the pathologic findings are summarized as follows:

The lesion is round, oval, or polyhedral, and varies in size from that of a pinhead to that of a silver dollar or even larger. The margins are at first wall-like; but later jagged with deep indentations and very much undermined. The base is reddened, coated over with yellow, and formed of gray tubercles or cheesy masses. Pain is always present. The ulcers are situated on the vault of the vagina or on the posterior vaginal wall near the portio. They may develop at any age. Tubercle bacilli must be differentiated from smegma bacilli by animal experimentation. Approximately 7.1 per cent of all cases of tuberculosis of the genitalia belong in this group.

GROUP 4. Luetic ulcers. Type 1 of this group are the primary ulcers. Forty-seven cases are known. In the majority ulcers were found also in the portio and vulva. There are two forms: the parchment chancre, a flat, red or dull brown movable ulcer and the typical hard ulcer. The inguinal or pelvic glands are swollen. Type 2 are ulcers showing secondary changes such as papules with a tendency to erosion. These are rare. Type 3 are ulcers of the tertiary stage, of which fourteen are known. Usually these are found in the lower third of the vagina. They have a semicircular, crescent, or kidney shape and vary in size from that of a dime to that of a half-dollar. The base is deep, often segmented, and covered with an amyloid coating. The lesion

bleeds easily, but is painless, and in pregnant women tends to phagedenic degeneration.

GROUP 5. Soft ulcers. In 3.4 per cent of the cases the ulcer occurs in the vagina. It has a delicate dentated margin, slightly undermined, and an inflammatory zone. Its base is often nodular with an amyloid coating. It bleeds easily and is painful. In the soft elevated ulcer, which is relatively common, the base is elevated and smooth. The Ducrey-Unna streptobacillus and the inguinal bubo complete the findings.

GROUP 6. About eighteen cases belonging to this group have been reported. In the majority the lesion was due to infection from the anus. Following superficial epithelial necrosis there is eschar formation and then ulcer formation by suppurative degeneration. The process spreads with countless small, round ulcers over the entire vagina, only small islands of mucous membrane escaping. Healing forms flat, slate-gray scars. There is never any atresia of the vagina.

GROUP 7. Diphtheric ulcers. Though vaginitis is not rare in diphtheria, only one case of primary diphtheria of the vaginal membrane has been described. On the posterior vaginal wall was a deep-seated ulcer covered with a dark brown membrane. Typical diphtheria bacilli were found.

GROUP 8. Uramic ulcers. Eichhorst observed the only known case. Flat, round, and elliptical ulcers with sharp margins were found on the anterior and posterior vaginal walls. The tissue adjacent to its margins was transformed into a necrotic, greenish gray, fatty mass. The remaining portions of the vagina were unchanged.

GROUP 9. Ulcers due to drugs. Hammer reported five cases of ulcer which developed during treatment with mercury. The ulcers were both single and multiple. One case of ulcer due to chromic acid corrosion has been described, and two cases have been reported in which criminal abortion was the cause of destructive processes involving the deeper tissues. In three cases ulcers appeared after radium therapy.

GROUP 10. Varicose ulcers. These have not been described previously in the literature unless possibly a case described by Unger as telangiectatic ulcer belongs to this group. The authors' case was that of a woman in the eighth to the ninth month of pregnancy. On the posterior wall of the middle third of the vagina was a segmented, irregular ulcer, about the size of a half-dollar, which was profusely permeated with dark red nodules. The base had a purulent, fatty coating, and the margins were raised and slightly infiltrated. The surrounding tissue was extremely vascular. Examination after excision revealed the absence of any specific characteristic and indicated definitely that this was an area of thrombosis of the vaginal veins, some of which had already undergone connective tissue organization.

KULENKAMPFF (Z).

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Gordon, O. A., Jr.: *The Management of Abortion, from a Study of 530 Consecutive Cases.* *Am. J. Obst. & Gynec.*, 1921, ii, 521.

The treatment of abortion has been primarily conservative. Its form depends upon whether the abortion is threatened, inevitable, or incomplete, aseptic or septic. Threatened abortions, which constitute a practically negligible number of hospital cases but a very considerable number of home cases, are treated by absolute rest maintained by the hypodermic administration of morphine sulphate in $\frac{1}{4}$ gr. doses. As a rule this type of case becomes either an inevitable abortion within twelve or eighteen hours or the pregnancy continues normally. The inevitable or incomplete case is the type constituting by far the largest number. These have been treated in the following manner:

Upon admission to the hospital the patient is shaved and the vulva are prepared as for labor. No examination is made prior to this preparation. A vaginal examination in the lithotomy position is then made with a bivalve speculum, and if any of the products of gestation are found in the vagina or protruding from the cervix they are removed with a sponge stick. No packing is introduced unless there is considerable hæmorrhage. If there is considerable bleeding, such as occurs in something over 70 per cent of the cases, packing is done. All patients with inevitable or incomplete abortion, whether they require packing or not, are given pituitrin in $\frac{1}{2}$ c.cm. doses every two hours for four doses. The packing is done with the patient in the lithotomy position without anæsthesia and under strict aseptic precautions. The vagina is tightly and thoroughly packed through a bivalve speculum with 2-in. strips of plain gauze. The author emphasizes the necessity of tightness and thoroughness in the packing.

The packing is removed from the vagina in from twelve to twenty-four hours, and in about 80 per cent of the cases requiring packing sufficient of the products of gestation will be removed from the vagina with it to render another packing unnecessary. If marked bleeding recurs, as in less than 20 per cent of the cases, a second packing is applied in the same way as the first. A very small percentage of the cases required packing more than twice and in none was packing done more than three times. If the patient continues to bleed following the second and third vaginal packings, as will occur in something less than 4 per cent of the cases, curettage may then be indicated.

The author has found that as his care in the management of these cases improves, the number requiring interference (and by interference he means any

intra-uterine manipulation) grows less. In cases with moderate bleeding continuing over some time there is frequently a retrodisplacement. This is overcome, at least temporarily, by the use of a retroversion pessary. The bleeding then soon ceases. All patients are instructed to lie upon the abdomen at least eight hours in twenty-four as this position favors both drainage and involution. They are allowed out of bed the day after bleeding ceases, and unless there is some special contra-indication they are discharged from the hospital two days later.

In none of the septic cases was there any intra-uterine manipulation or irrigation. Patients with sepsis were placed out of doors and in the Fowler position. Their feeding was forced as much as possible. Some patients received repeated blood transfusions of small quantities of blood at a time, some were given salvarsan intravenously, and others were treated by vaccines and sera. Thus far no special difference has been noted in the ultimate result or in the duration of the illness in the septic cases relative to any special type of extra-uterine treatment.

The author's conclusions are summarized as follows:

1. All cases of abortion, threatened, inevitable, or incomplete, should be treated conservatively until it is demonstrated that conservative treatment has failed.
2. Conservative treatment, properly executed, will fail in something less than four cases out of one hundred.
3. The mortality and morbidity in abortion cases is in direct ratio to the amount of intra-uterine interference. The greater the manipulation and interference, the higher the mortality and morbidity.
4. Curettage in abortion changes many aseptic cases into septic cases.
5. Curettage is therefore seldom indicated and often is actually harmful.
6. Conservative treatment has, if possible, a more positive indication in septic than aseptic cases.

E. L. CORNELL, M.D.

LABOR AND ITS COMPLICATIONS

Newell, F. S.: *Abdominal Abortion.* *Am. J. Obst. & Gynec.*, 1921, ii, 606.

By the term "abdominal abortion" is meant the termination of pregnancy before the period of viability by abdominal hysterectomy in preference to pelvic operation.

The principal advantages of abdominal hysterectomy are that it can be performed under local anæsthesia on patients who are considered poor

risks for general anaesthesia, and that, since the contra-indication to pregnancy is permanent, the termination of the pregnancy can be supplemented by sterilization. The present pregnancy can be ended and future pregnancies made impossible at a single operation with minimal risk.

The ordinary indications for abdominal abortion are, first, serious cardiac lesions which at some previous time, either during or before the pregnancy, have resulted in decompensations, particularly those causing signs of failing compensation early in the present pregnancy, and second, cases of chronic nephritis in which the disease is distinctly progressive and the history shows that recent attempts at childbearing have resulted invariably in the birth of stillborn children in spite of adequate medical attention.

Quiescent though not arrested pulmonary tuberculosis in patients who already have children would seem a proper indication both for the termination of the present pregnancy and for sterilization after due consultation with the patient.

Occasionally cases of diabetes which do not yield to ordinary treatment may also offer indications for sterilization in addition to the termination of the pregnancy.

The operation is most useful, however, in the cases of patients with decompensated cardiac lesions in which attempts to restore compensation have failed. In such cases the use of a general anaesthetic may be possible, but as a rule operation can be performed more safely under local anaesthesia.

The author has adopted local anaesthesia preceded by the administration of morphine and scopolamine for caesarean section at full term when the use of a general anaesthetic has been advised against by a competent medical consultant. With the exception of the occasional case in which first-intention healing of the abdominal wound was interfered with by too free infiltration of the abdominal wall with novocaine when the patient's general resistance was below normal, he has been entirely satisfied with the results.

The technique of abdominal abortion under local anaesthesia is described in detail as follows:

About two and one-half hours before the time set for operation the patient is given $\frac{1}{6}$ gr. of morphine and $\frac{1}{200}$ gr. of scopolamine by hypodermic injection. The scopolamine is repeated at forty-minute intervals, but usually it is not necessary to repeat the morphine. Three or four doses of scopolamine, but occasionally more, are necessary to produce quiet sleep. The patient's eyes are covered and the ears plugged. She is brought to the operating room as quietly as possible, and no unnecessary noise or conversation is allowed in the operating room.

The field of operation is prepared quickly with iodine and the site of the incision is anaesthetized with $\frac{1}{2}$ per cent novocaine, care being taken to anaesthetize the skin thoroughly and also the fascia layer.

After the proper interval the abdomen is opened in the usual way, a low median incision being made just above the symphysis. If the pregnancy is of more than three and one-half months' duration, the uterus can be easily manipulated through such an incision without great traction on the peritoneum. In earlier cases the uterus must be grasped with hooks and drawn up to the wound, at times considerable traction being necessary. This may cause some reaction, but as a rule it is not great. The uterus, which is practically non-sensitive, can be opened, the ovum removed with the finger, and the wound sutured without any marked reaction although some patients will move more or less and occasionally groan.

If sterilization is to be done under local anaesthesia the most satisfactory method is excision of the tubes from the cornua of the uterus. In the author's experience the injection of a syringe full of novocaine into the inner portion of the broad ligament and the cornua of the uterus is advisable before this is done. The presence of old abdominal adhesions increases the difficulty of the operation to some extent since peritoneal adhesions are extremely sensitive, but they can be injected with novocaine and then cut and tied if a proper interval is allowed for the action of the novocaine. The manipulations necessary to remove the uterus under local anaesthesia would probably be very painful because of the traction of the peritoneum. Therefore this method of sterilization has not been attempted under local anaesthesia. In the operation described, the uterine incision and the abdominal wall are closed as in any ordinary caesarean section and the patient then treated as after any other laparotomy.

Surgical shock has been absent in most cases and postoperative vomiting has not occurred in any.

This method of operation is a distinct advance for patients who present permanent contra-indications to pregnancy and in whom sterilization is considered justifiable. There is less shock and less loss of blood than in abortion by the pelvic route, and in addition the recurrence of pregnancy is prevented.

E. L. CORNELL, M.D.

Holland, E.: Methods of Performing Caesarean Section. *J. Obst. & Gynec. Brit. Emp.*, 1921, xxviii, 349.

The results of about 4,000 caesarean sections performed for various indications during the period from 1911 to 1920 are reported. The total number of cases in which the operation was performed for pelvic contraction was 3,374.

Satisfactory as is the classical operation, it has certain disadvantages both in theory and in practice, and lately these have been coming to the front. In fact, at the present time there is much uncertainty regarding caesarean section. The defects of the classical operation as met with in practice are as follows:

1. The risk of sepsis in infected or suspected cases. The classical operation is not safe when

infection is suspected or present, i.e., when labor is advanced and the membranes are ruptured, and when there have been many vaginal examinations or attempts at delivery by forceps.

2. The risk of rupture of the scar in a subsequent pregnancy or labor. Quite apart from rupture of the scar, which is comparatively rare, the proportion of thin and defective scars found at subsequent operations is very high.

3. The risk, a rare one, of intestinal complications during convalescence.

4. Adhesions between the uterine scar and intestine, omentum, or abdominal wall, which sometimes cause much difficulty in subsequent operations.

It is easy enough to perform a classical caesarean section, but the greatest care must be taken to suture the uterine wound properly. This is the step in the operation which is apt to be done imperfectly. There must be no hurry; every suture must be inserted and tied deliberately.

The best method of suturing is that in which interrupted sutures are passed through the whole thickness of the uterine wall except the decidua. An essential point is that they start well outside the edges of the incision so as to include a good thickness of the uterine wall.

Closure of the uterine peritoneum is of great importance in preventing the leakage of sepsis from the interior of the uterus to the peritoneal cavity.

The author first incises only the peritoneum throughout the length of the proposed incision and then reflects it for half an inch all around. The muscle is next incised in the usual way through the length of the bared area. In suturing the wound the muscular wall is sutured first; the reflection of the peritoneum allows the needle to be inserted well outside the edge of the muscle so that it takes a wide bite. After this layer is tied, the reflected peritoneal edges can be accurately united, first by a running suture and over that by a Lembert suture. It is important to wait for complete retraction before inserting the sutures. The author considers silk-worm gut the best suture material, silk the next best, and catgut most unsuitable.

The advantages of the cervical over the classical operation are the following:

1. The wound lies in a quiet part of the uterus and is at rest during healing. There is no tendency for the edges of the wound to be drawn apart or for gaps to form between the sutures. For these reasons healing occurs under more favorable circumstances than following the classical operation.

2. The uterine incision is made through a less vascular area, and bleeding from the edges is extremely slight.

3. The edges of the wound are thin; suture is therefore easier and quicker.

4. The position of the wound is such that adhesions to the intestines, omentum, or abdominal wall cannot occur; there is only a short line of peritoneal sutures at the bottom of the uterovesical pouch.

5. The uterine wound is covered with a thick layer of fascia and by the bladder, and perfect closure of the peritoneum is possible.

6. The operation causes less disturbance of the abdominal contents; the intestines are never seen.

7. The scar is in a safer area for subsequent pregnancy and labor as the lower uterine segment stretches late in labor.

8. The operation is just as easy to a practised surgeon as the classical procedure.

It is obvious that a great deal more experience and careful recording are necessary before a sound conclusion can be drawn regarding the relative merits of the classical and lower segment operations. In the future, Holland will employ the transperitoneal lower segment operation for all cases unless the lower segment is hard to get at, as when the abdominal cavity is short in cases of diminutive stature or kyphosis. A conservative practice would be to use the operation only when the patient has been long in labor, when it is easier, and when infection of the wound is to be feared.

E. L. CORNELL, M.D.

Kerr, J. M. M.: Indications for Caesarean Section.
J. Obst. & Gynec. Brit. Emp., 1921, xxviii, 338.

In general, unless the child is very small, caesarean section should be chosen whenever the conjugata vera is under $3\frac{1}{4}$ in. (8.1 cm.). Even when it measures as much as this, the operation may be indicated occasionally. When the conjugata vera is $3\frac{1}{4}$ in. one must estimate very carefully the relative size of the head and the pelvis. Any other procedure than caesarean section should be employed only if the overlapping is slight and a certain degree of fixation of the head in the brim of the pelvis can be secured.

Pubiotomy is relatively seldom a suitable method in cases of contraction at the pelvic rim because the gain in the conjugate is slight for each inch of separation at the symphysis. The cases in which it is suitable are those in which the accoucheur has carefully estimated the relative size of the head and the pelvis, has erroneously come to the conclusion that spontaneous delivery will occur, has made one or two attempts with the forceps (employing moderate traction), and has failed to deliver. Under such circumstances pubiotomy gives excellent results.

For contractions at the outlet, pubiotomy is especially suitable because every inch of separation of the pubic bones gives a corresponding increase between the tuberosities of the ischia. Cases of pronounced kyphotic or masculine pelvis, in which the head is arrested at the outlet, are the most striking examples.

The induction of labor does not come into competition with caesarean section as the results of the former are very rarely satisfactory if the conjugata vera is under $3\frac{1}{4}$ in. Induction of labor is indicated in cases in which at a previous parturition the accoucheur experienced difficulty in extracting the child with the forceps and it is believed that a slightly smaller child can be delivered easily.

It is generally agreed that if a fibroid tumor obstructs the passage of the child from the uterus the only procedure is cesarean section. On no account should the child be dragged past the tumor. In connection with this indication the author summarizes in tabular form eighty-eight cases with a maternal mortality of 8 per cent and a foetal mortality of 19 per cent. The high foetal mortality is accounted for by the fact that in a considerable number of cases the children were premature, and in many the tumors interfered with the growth and development of the foetus. A few of the cases might have been dealt with by myomectomy and vaginal extraction of the child.

Cesarean section is rarely necessary in cases of ovarian tumors complicating labor. In such cases the tumor should be removed and the child delivered through the vagina. The ovarian tumor can generally be raised out of the pelvis and removed if the patient is placed in the Trendelenburg position and an assistant pushes it up from the vagina if it is impacted in the pelvis. In the very exceptional cases in which the tumor cannot be removed, cesarean section is indicated. In thirty-nine cases of cesarean section for this complication the maternal mortality was 10 per cent and the foetal mortality 8.6 per cent.

In addition to these more common tumors, the author's tables include two cases of broad ligament cysts, four of malignant ovarian tumors, one of tumor of the bladder, ten of tumors of the pelvis, nine of tumors of the pelvic colon and rectum, and twenty-five of carcinoma of the cervix. Taking all of these cases together the maternal mortality was 17.6 per cent and the foetal mortality 33 per cent. Practically all of the deaths were those of patients with carcinoma or malignant ovarian tumors.

In 195 cases in which cesarean section was performed for eclampsia the maternal mortality was 31 per cent. There is no doubt that this would have been lower if the operation had been performed earlier. The great difficulty in these cases is the selection of those suitable for this very radical procedure. Everyone who has been engaged in obstetrical practice for any length of time has encountered many most unpromising cases which recovered following ordinary medical and obstetrical procedures.

The cases suitable for cesarean section are those in which the pregnancy is well advanced but there is no dilatation of the cervix or attempt at labor, and after six hours there is no improvement from blood-letting, intravenous saline infusion, and morphine. When the seizures occur earlier in pregnancy than the thirty-second or thirty-third week, vaginal cesarean section is preferable.

At the present time the author is fairly well convinced that cesarean section should always be selected in the case of a primigravida with a central placenta prævia as the plugging, manual manipulation, version, and delivery of the shoulders and head are associated with much greater danger to the mother and infinitely greater danger to the child. He has employed it in six cases, and in all the mother

and child were saved. In this particular condition it is of vital importance to operate early.

Cesarean section is indicated only in the severe cases of accidental hæmorrhage.

There are fourteen cases of ventrofixed uteri in which cesarean section was done; none of the mothers died but there were two foetal deaths.

In three cases cesarean section was necessary following the interposition operation.

Few obstetricians of experience would advocate cesarean section for prolapse of the cord.

The author never employed the operation for impacted shoulder presentation as it is very seldom necessary or advisable. In four cases operated upon there were two maternal and two foetal deaths.

The tables show eleven cesarean sections performed because of large size of the child, four for large head, two for occipitoposterior position, two for brow presentation, and three for impacted breech presentation—in all, twenty-two cases. None of the mothers died but there were two foetal deaths (9 per cent). As far as these conditions are concerned Kerr feels certain that the majority of obstetricians would admit them as justifiable indications under special circumstances. The great difficulty is the determination of the degree of dystocia which may be encountered.

Rigidity of the cervix and vagina is also placed in the list of indications. Although a few cases are encountered in which cesarean section is indicated—for example, old cicatrices seriously obstructing the passage—few surgeons advocate the employment of such radical measures for even extreme rigidity of the cervix.

Under the heading of grave diseases threatening the life of the mother there were forty-two cases of cardiac disease with a maternal and foetal mortality of 20 per cent; two cases of advanced pulmonary tuberculosis, with no deaths; four cases of intestinal obstruction, with two maternal deaths; and one case each of diabetic coma, septicæmia, and chorea, all of which were fatal.

The author is convinced that twenty years hence the accepted indications for cesarean section will be extended even beyond the limits suggested.

E. L. CORNELL, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Roos, T.: *The Treatment of Puerperal Sepsis* (Zur Behandlung der puerperalen septischen Erkrankungen). *Fortschr. d. Med.*, 1921, xxxix, 708.

The author discusses the best methods of treating puerperal sepsis with special reference to those used during the last few years at the Hess Midwife Institute in Mainz. In view of the severity of the infection, no remedy should be left untried which offers any promise of success whatever. The local treatment of puerperal ulcers and septic endometritis has been entirely abandoned as it is absolutely impossible to sterilize an infected wound mechanically or chemically. Moreover, local treatment of the

internal genital organs may be injurious. The same is true of vaginal and uterine douches which may force septic material into the tubes and even into the peritoneum. Douching is frequently followed by a chill and, as the result of the breaking through of the wall of granulation formed by the body, peritonitis, thrombophlebitis, septic thrombosis, or general sepsis may develop.

Instrumental cleansing of the septic endometrium and atmocausis, which apparently provide a favorable culture medium for the bacteria in the uterus, have also been abandoned. Uterine douches are employed today only when there is pronounced stasis of the lochial secretion with absorption and high fever. Removal of ichorous foetal or placental remains with the fingers is followed by a douche forty-eight hours after the disappearance of fever. It is best to leave small placental remains untouched during fever as digital or instrumental removal is more dangerous even after a period of weeks.

Attempts to improve the condition by operative removal of the infected organ usually fail. Frequently peritonitis or septicopyæmia results and these as a rule are soon fatal. Whether an abdominal or a vaginal hysterectomy is done, the entrance of virulent bacteria into the operative wounds, the connective tissue, the peritoneum, and the opened blood vessels can rarely be prevented. Surgical treatment is usually restricted to: (1) the opening of abscesses of the pelvic connective tissue, (2) incision, irrigation, and drainage in diffuse purulent peritonitis, and (3) ligation of the veins in thrombophlebitis. The author advises allowing the abscesses to point. They can then be reached much more

easily and with less danger either through the vagina or by abdominal incision, and heal rapidly without complications. Encapsulation is obtained best by rest and the administration of opiates. The application of heat is recommended to aid in the decrease and absorption of encapsulated abscesses.

In the presence of a puerperal peritonitis having its origin in a pelvic peritonitis, which as a rule cannot be expected to become cured spontaneously, immediate operation is indicated. In the beginning of this condition muscular tension is frequently absent, but more rapid and superficial breathing, nausea or vomiting, and a more rapid and increasingly smaller pulse are characteristic. The opening is best made in the midline under local anæsthesia. The incision should be only a few centimeters long. Secretions should be drained with rubber drains and, if necessary, several counter-openings should be made. Irrigation with saline solution is contraindicated as it might spread the process further. Ether may be poured into the abdominal cavity. In especially severe cases only adrenalin-saline solution should be given intravenously. Electric light treatment, diathermy of the pelvis, etc. find a wide application.

An experience of many years in the treatment of puerperal sepsis has demonstrated that intravenous injections of the silver colloids and the acridin salts (acriflavine) deserve special consideration. The prophylactic administration of these preparations to enable the body to overcome a spreading infection is also recommended. In addition, analeptics, cardiac stimulants, alcohol baths, and a nourishing fluid diet are indicated.

BODE (Z).

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Le Fur, R.: Notes on Various Methods of Kidney Exploration and Their Trustworthiness. *Med. Press*, 1921, n.s. cxii, 528.

The author describes more or less in detail the various methods of determining kidney function, paying special attention to experimental polyuria, maximum concentration, and azotæmia tests. As we must know not only whether the kidney is functioning but also the maximum activity of which it is capable, a functional test which will indicate the "margin of safety" is necessary. Clinically, the urea elimination is the best test. This can be determined in two ways: (1) by increasing the quantity of urine (experimental polyuria), and (2) by increasing the concentration of urea (maximum concentration test). It is wise to make both tests. Moreover, as the fact that a kidney has the power to excrete the maximum amount of urea is of no value unless the blood urea is normal in amount, the blood-urea test (azotæmia) is indispensable.

Ambard's constant may be worked out to advantage if it is used to corroborate the azotæmia test, but the author considers the azotæmia test more reliable.

Color tests, the elimination of phloridzin, sodium chloride, etc. are of no more value than the first and second tests mentioned.

HORACE BINNEY, M. D.

Smith, E. C.: A Case of Unusual Solitary Tuberculoma of the Kidney. *J. Urol.*, 1921, vi, 371.

Few cases of isolated tuberculous granuloma occurring in the kidney, liver, or spleen have been recorded. The usual types are miliary or pyonephrotic, having a secondary relationship to active or quiescent foci in some other part of the body.

The case reported in this article was that of a young adult with definite unilateral renal tuberculosis. For one week previous to operation there was a persistent elevation of temperature not explainable by pulmonary tuberculosis or other common causative condition. Following the removal of the diseased kidney, an intense streptococcic septicæmia developed and later a fatal peritonitis.

Pathologic examination of the kidney and a complete autopsy showed a large solitary renal tuberculoma and absence of any other focus of tuberculosis in the body.

The author draws two conclusions from this case: (1) persistent fever unexplained by pulmonary lesions or other usual causes is a contra-indication to immediate operation in renal tuberculosis, and (2) closer co-operation between the pathologist and the surgeon will be of benefit to both, and especially to the surgeon.

H. W. PLAGGEMEYER, M.D.

Helmholz, H. F.: Modes of Infection in Pyelitis. *Am. J. Dis. Child.*, 1921, xxii, 606.

Since identical symptoms may be produced by cortical abscess of the kidney and infection of the ureter, pelvis, or bladder, urine examinations are of little value in localizing a lesion of the genito-urinary tract. No large series of cases of pyelitis has been studied except by means of bladder cultures, and this procedure determines simply that the organism obtained came from some point in the genito-urinary tract. By means of ureteral catheterization, the location of a lesion higher up in the urinary tract may be determined. This helps little in the determination of the mode of infection, but it demonstrates the numerical incidence of infections of the bladder and kidney.

The number of necropsies in cases of pyelitis is relatively small, and no satisfactory bacteriological study has been made in any of them. Only instances in which necropsy is done very soon after death may be considered in the bacteriological investigation as the bacillus coli rapidly penetrates the organs after death. The pathologic report is negative in so many cases of pyelitis that every effort should be made to obtain all possible bacteriological evidence of the site of the lesion. Cultures from the bladder, ureters, and kidneys will give an idea of the uppermost point of involvement of the urinary tract. By this means, a comparative localization may be made which it is impossible to make during life.

The only conclusions of value to be drawn from postmortem examinations of cases of pyelitis are those drawn from instances in which examination was made very shortly after death, since it is well known that the mucous membrane of the pelvis is rapidly macerated by the urine. The pathologic findings of Thiemich, abscesses of the renal cortex unassociated with lesions of the bladder or pelvis, are probably due to the coccus group of organisms, and not to bacillus coli. In spite of the large amount of infectious material that must have passed through the pelvis, no involvement of the pelvic mucous membrane was found.

In cases of renal involvement definitely secondary to lesions of the lower urinary tract there is usually such marked destruction of tissue that the histologic picture is of practically no value as an indication of the mode of infection. In the majority of such cases there is some condition damming the flow of the urine.

It has been shown that renal infection by the hæmatogenous route results in cortical lesions, while an inflammatory condition in the pelvis tends to localize in the papilla. At the present time this is the only feature which makes possible a histologic differentiation between hæmatogenous and ascending pyelitis.

Regarding the direct passage of organisms from the intestinal canal to the kidney by way of the lymphatics the author states that not sufficient evidence has been brought forward to warrant a discussion at this time. In view of the manner in which the lymphatic system develops, there is a possibility that in some cases a direct connection persists.

G. H. JACKSON, JR., M.D.

Kretschmer, H. L.: The Treatment of Pyelitis.
Surg., Gynec. & Obst., 1921, xxxiii, 632.

This article is based on a study of 200 cases of pyelitis or pyelonephritis. Lesions of a surgical nature were excluded. These cases may be divided into the following clinical groups: (1) the pyelitis of infancy and childhood; (2) the pyelitis of pregnancy; (3) the pyelitis of matrimony; (4) pyelitis following surgical operations; and (5) simple pyelitis. It is believed that in the pyelitis of matrimony, or "defloration pyelitis," the colon bacilli gain entrance through the tears in the hymen.

A careful search was made in every case for the presence of lesions of other organs which might have been factors predisposing to the occurrence of kidney infections, relapses, or failure of treatment. Thirty per cent of the patients had constipation and a small number had hæmorrhoids, fissures, fistulæ, etc. Frequently the clearing up of infections of the prostate and seminal vesicles was associated with the cure of the pyelitis.

Renal infections may occur at any age but are most common in adults, 25.5 per cent occurring between the thirty-first and fortieth years of age. The author believes it not improbable that many cases of cystitis in infancy and childhood are in reality cases of pyelitis. Of the patients whose cases are reviewed, 39 per cent were males and 61 per cent were females. The bacteriological examination showed colon bacilli in 132 cases, staphylococci in twenty-eight, streptococci in one, colon bacilli and staphylococci in ten, and staphylococci and streptococci in one. The findings in twenty-seven are not given. Both kidneys were infected in ninety-nine cases, the right kidney alone in thirty-two, and the left kidney alone in seventeen. In twenty-one cases the bladder and both kidneys showed pus.

Of the 177 cases in which more or less accurate cystoscopic data were obtained, 128 showed pathologic changes; 75 per cent showed bladder changes which varied in intensity from a slight amount of hyperæmia around the internal urethral orifice to a generalized cystitis. Pyelography was not carried out as a routine procedure, but when pyelograms were made they showed the usual picture of infection.

Bladder distress was by far the most common complaint. There was frequency in 66.5 per cent of the cases; burning in 37.5 per cent; painful urination in 30.5 per cent; turbidity of urine in 32.5 per cent; blood in the urine, usually of moderate degree, in 24 per cent; urgency in 8 per cent; incontinence in 5 per cent; difficulty in 9.5 per cent; chills in 23 per cent; and a definite history of fever in 37.5 per cent. The

patients with pyelitis of pregnancy appeared to be more acutely ill than the others.

While the diagnosis of infection of the renal pelvis is not very difficult, being based on the examination of divided specimens of urine, colon bacillus pyelitis has often been mistaken for a number of diseases. Stricture of the ureter, large hydronephrosis, and renal tumor can be differentiated by the pyelogram. Diligent search for the tubercle bacillus in association with the colon bacillus must be made. Repeated guinea pig inoculations often prevent an incorrect diagnosis.

In 44.5 per cent of the cases there was a history of some sort of surgical operation. Such patients fall into the following four groups:

Group 1. Those who were operated on because of urinary symptoms, but were not relieved by the operation, the inference being that they were operated on with insufficient study of the case.

Group 2. Those who exhibited urinary symptoms for the first time after some surgical procedure. In the presence of insufficient data it is within the bounds of probability that the so-called pyelitis (postoperative) may have been an exacerbation of a latent pyelitis. Some of the cases in this series, however, were cases of genuine postoperative pyelitis.

Group 3. Patients who had been operated upon many years before they came under observation.

Group 4. Patients who had had kidney operations; in four there had been a nephrectomy with resulting pyelitis in the remaining kidney in each case.

In cases of acute colon bacillus pyelitis instrumental or local treatment was not resorted to, the one exception to this rule being the pyelitis or pyelonephrosis of pregnancy. The treatment of chronic pyelitis may be considered under the following heads: vaccine therapy, medical treatment, and pelvic lavage. Early in this work vaccines were used in conjunction with other forms of treatment, but as it soon became evident that they were not of great value they were discontinued. Since then the author finds that the results have been as satisfactory as before. Internal treatment consisted of the use of alkalies, acids, and urotropine. The routine management was instituted with the administration of one teaspoonful of sodium bicarbonate in water three times a day, enough to render the urine distinctly alkaline. Patients unable to take the sodium bicarbonate were given citrate of potash or citrate of soda. When the urine had become alkaline, 10 gr. of urotropine were given three times a day and 10 gr. of acid sodium phosphate four times a day until the urine became distinctly acid. In the acute cases of pyelitis the internal treatment had a certain value, but as some of the patients with this type of infection get well without medication the value of these drugs remains questionable.

In the author's opinion pelvic lavage is the most efficient method of treatment. At times, even after a single ureteral catheterization for diagnostic purposes, the pyuria and infection clear up. Various drugs have been used for pelvic lavage; Koll has ob-

tained gratifying results with aluminum acetate. Mercurochrome has been suggested and the organic silver preparations are in wide favor. In the series of cases reported silver nitrate alone was used. The amount of solution employed depended on the individual case, but the average amount was from 8 to 10 c. cm. of a 0.5 to 2 per cent solution. The lavage was usually done twice a week or at five-day intervals until the urine was sterile on three successive tests.

As it is a well-recognized fact that conditions of the gastro-intestinal tract such as chronic constipation, colitis, etc., produce lesions of the urinary tract, routine examination of the rectum for hæmorrhoids, fissures, etc., of the prostate and seminal vesicles in the male, and of the female genitalia followed by appropriate remedial measures of pathologic conditions found was of material benefit in clearing up the renal infection.

The author's summary is as follows:

1. Pelvic lavage with silver nitrate is an efficient and simple method of treating infections of the renal pelvis.

2. In the series of cases reported, 66.4 per cent of the patients treated were finally discharged with urine sterile and free from pus.

3. In selecting cases for treatment, lesions of the urinary tract which are of a surgical nature must be excluded.

4. Lesions of the abdominal viscera which may be factors in contributing to relapses or rendering this treatment inefficient must be recognized and subjected to appropriate treatment.

5. Special stress must be laid upon proper attention to lesions of the gastro-intestinal tract.

6. Lesions of the male and female genital tract must receive proper treatment.

7. Careful routine examinations of the urine in all cases of obscure abdominal pain should be made before the patient is subjected to surgical operation.

C. D. HOLMES, M.D.

Rehn, E.: The Causes of Secondary Hæmorrhage Following Nephrotomy and Its Prevention (Ueber die Ursachen der Spätblutungen nach Nephrotomie und deren Verhütung). *Berl. klin. Wchnschr.*, 1921, lviii, 1217.

The fact that severe and even fatal secondary hæmorrhages occur occasionally after nephrotomy induced Rehn to investigate their causes by experiments on animals. He found that the bleeding is due to congestion caused by displacement of the kidney resulting from insufficient operative fixation, too early activity after the operation, or excessive pressure exerted on the large veins by the over-filled pelvis of the kidney whose emptying through the ureter has been hindered by coagulated blood. In such cases the sutures in the kidney burst.

To prevent this accident the kidney must be well fixed and the renal pelvis drained into the bladder as well as externally. Accurate suturing of the parenchyma is also essential. Since Rehn has paid

particular attention to these points no further hæmorrhages have occurred in his cases.

VON TAPPEINER (Z).

Culver, H.: Papilloma of the Ureter. *J. Urol.*, 1921, vi, 331.

Culver reports a case in which a neoplasm was found 4 cm. from the upper end of the ureter and another small sessile growth about 1 cm. from the first growth. The histologic diagnosis was papilloma.

The clinical history was that of hæmaturia and colic due to the passage of clots. Nephrectomy gave relief from the bleeding for ten days. At the time of its recurrence cystoscopic examination showed a large clot protruding from the ureteral orifice. The ureter was then dissected out. Convalescence was uneventful.

Culver has been able to find only fifteen cases of ureteral papillomata reported in the literature.

IRVIN S. KOLL, M.D.

BLADDER, URETHRA, AND PENIS

Kretschmer, H. L.: Spinal Cord Bladders Occurring in Pernicious Anæmia. *J. Urol.*, 1921, vi, 195.

The author reports a series of four cases of pernicious anæmia which were studied by him from the urological point of view. They all presented the group of bladder symptoms usually associated with spinal cord lesions. Kretschmer therefore emphasizes the fact that, in addition to the usual causes for spinal cord bladders, pernicious anæmia must be borne in mind.

The subjective bladder symptoms in the early stages of pernicious anæmia are difficulty in urination suggesting urinary obstruction, a feeling of incomplete emptying of the bladder, and possibly frequency. Later, retention or incontinence develops.

In two of the cases studied the cystoscope showed fine trabeculations, and in two others, a severe cystitis. In three cases the urine obtained from both sides by ureteral catheterization showed infection. The colon bacillus was present in all three, and in two there were other bacteria.

HENRY L. SANFORD, M.D.

Hunt, V. C.: Submucous Ulcer of the Bladder and Its Surgical Treatment. *Minnesota Med.*, 1921, iv, 703.

Until recently, ulceration of the bladder was referred to as cystitis secondary to infection elsewhere in the urinary tract and the ulcer was not subjected to direct surgical attack.

In 1914 Hunner reported eight cases in which "a rare type of bladder ulcer" formed a definite pathologic basis for the so-called "irritable bladder." Sixty-two similar cases have been reported in the literature since then and fifty-three of these have been confirmed by operation. The term "submucous ulcer" is based on the pathology of the lesion.

Of thirty-seven cases observed in the Mayo Clinic, twenty were confirmed by operation.

The etiology of submucous ulcer is obscure. The incidence is high in females. Eighteen of the author's cases were those of women, but apparently pregnancy, pelvic infections, and pelvic operations were not etiological factors. The lesion is probably not due to a urine-borne infection because the ulcer is usually located on the dome and lateral walls of the bladder and the urinary tract is usually free from infection. Hunner suggested the teeth, tonsils, and sinuses as foci; the weight of evidence seems to favor a blood-borne infection, which would place the lesion on the same etiological basis as gastric and duodenal ulcers.

The work of Rosenow on the selective localization of bacteria, and the more recent animal experiments of Bumpus and Meisser, who demonstrated the selective affinity of certain strains of streptococci for the urinary tract, have a significant bearing on the subject. It seems justifiable to conclude from their work that submucous ulcer and other infections of the urinary tract may be due to foci harboring streptococci which have a selective affinity for the urinary tract. These investigations found diplococci in the ulcer excised in two cases.

The ulcer is the result of chronic inflammation involving all the coats of the bladder and is usually surrounded by a variable amount of oedema which may extend into the paravesical tissues. The lesion is usually single, but may be multiple. The ulcer itself is small (in the author's cases it varied from 3 mm. to 2.5 cm. in diameter) but the surrounding oedema and inflammatory zone may be very extensive.

The usual complaints are pain, frequency, and vesical irritability. The pain may be referred to the perineum, rectum, or inguinal region. The extreme irritability of the bladder is little benefited by lavage or local applications. The lesion occurs most frequently in the middle decade of life. The average age of the patients at the time of examination was 40.7 years. The average age at onset was 32. The long duration of symptoms and the resistance of the lesion to all forms of treatment are characteristic.

The diagnosis is based on the history, urinalysis, and cystoscopic findings. Hunner states that when a patient has had years of bladder misery in spite of many courses of treatment, the urine is macroscopically clear and free from infection, but contains blood cells and leucocytes, and the cystoscopic examination reveals one or more ulcers, a diagnosis of this type of ulcer is justified. The cases observed in the Clinic conformed in a general way to this description.

Formerly treatment included bladder lavage, suprapubic cystostomy, and fulguration of the lesion. Only temporary relief was secured. Many patients were subjected to pelvic operations without success. Hunner was the first to attack the ulcer directly by surgical methods; he advocates wide excision, including the area of surrounding oedema. The results of surgical treatment show that excision

of the ulcer is not sufficient for permanent cure as a certain percentage of the ulcers may recur.

In the twenty cases treated in the Clinic by operation the immediate results of surgical excision were excellent, but ultimate cure was not always obtained. Seventeen of the twenty operative cases were followed. Five patients reported freedom from symptoms from one to three years, and five reported improvement from four months to three years after the operation. In three cases there was no improvement. Four patients obtained temporary complete relief, but all the symptoms returned later. In one of these cases cystoscopic examination revealed recurrence of the ulcer after one year.

Many of the reports in the literature are based on the immediate results rather than the late results. Hunner reports a recurrence of the ulcer one and one-half years after operation, and Keene reports a recurrence of symptoms after seven months. From a study of the reported cases it seems that the possibility of recurrence cannot be eliminated within two years after operation. The large numbers of patients who obtain permanent or temporary relief justify the surgical excision of this type of ulcer in all cases. Hunner's wide excision of the inflammatory area and the removal of all foci of infection about the teeth, tonsils, and sinuses should increase the percentage of cures and decrease the number of recurrences.

V. G. BURDEN, M.D.

GENITAL ORGANS

Isnardi, L.: Operative Treatment of Varicocele without Injury to the Spermatic Cord or Scrotum (Zur operativen Behandlung der Varicocele, ohne weder den Samenstrang noch das Scrotum zu verletzen). *Zentrabl. f. Chir.*, 1921, xlviii, 1382.

The observation that varicocele associated with inguinal hernia disappears after the Bassius operation suggested to Isnardi the following procedure:

The skin incision and the incision of the aponeurosis and external oblique are made as in Bassius' operation, except that they are almost vertical. The spermatic cord is then raised and placed in the uppermost angle of the incision, the aponeurosis being sutured under it so as to bend it.

The results were good.

SCHULZE (Z).

Fischer, H.: Hæmostasis in Suprapubic Prostatectomy by the Method of the "Lost Tampon." *Ann. Surg.*, 1921, lxxiv, 768.

In the order of their frequency, the complications apt to mar the results of suprapubic prostatectomy are hæmorrhage, shock, uræmia, and sepsis. That the problem of hæmostasis has not been adequately solved is shown by the fact that so many different methods have been advocated to deal with this complication. Anatomically, the bleeding bed of the prostate will be more or less filled with urine so that any packing for hæmostasis easily becomes wet and loosened and therefore ineffective. The dangerous bleeding comes, not from the mucosal vessels of the

urethra or the bladder, which can be caught and controlled fairly easily, but from the bed of the prostate itself. As the true capsule is only fairly resistant, it is easy to see that in difficult enucleations it may be torn through and more or less severe hæmorrhages may result from injuries to the plexus of Santorini and the vesical plexus.

Three different methods of controlling these hæmorrhages have been suggested: (1) packing of the prostatic bed with a gauze tampon; (2) continuous irrigation with hot saline or mildly antiseptic solutions; (3) the use of mechanical contrivances such as the Hagner or Soresi bag. Plain gauze tampons have been tried on account of their simplicity and availability. Squier packs the cavity with a strip of gauze which he leads out of the bladder through the drainage tube. Beer attaches a silk string to the packing and carries this out through the drain. Freeman employs a strip of iodoform gauze or gauze soaked in some styptic material. The pack is held in place by a pair of blunt forceps. The handles of the forceps are carried out through the incision and pressure is made on them with the dressings and the bandage. This method is open to the objection that the patient is wet and the packing causes a certain amount of pain. Continuous irrigation with hot saline or mildly antiseptic solutions has been tried without invariable success. Hagner used a rubber bag in the bed of the prostate which he kept distended with air. Soresi uses the same bag distended with mercury. The objection to these mechanical contrivances is that they easily get out of order, are cumbersome, and are not always at hand. After all, the best means of controlling hæmorrhage is the simplest and one which does not require special instruments, viz., packing with gauze. In order to overcome the tendency of the pack to become wet with urine and therefore to become loose, pressure was tried. Deaver and Kammerer were the first to employ sutures of the intravesical wound edges over the tampon.

In Fischer's method the edges of the wound are caught up with a few Allis forceps. A strip of iodo-

form gauze is tightly packed into the cavity until it is filled, and the projecting portion of the packing is then cut off. If the hæmorrhage is controlled, this tampon is removed and used as a pattern for the size of the final tampon which is secured by a stout silk ligature around the center. After the insertion of this tampon into the bed of the prostate the wound edges are sutured with strong plain catgut over the tampon so that the prostatic cavity is entirely shut off from the bladder. The prevesical space is drained by a small cigarette drain. After three or four days the intravesical sutures become loose and the tampon can be withdrawn by pulling on the silk ligature, the drainage tube being removed at the same time. Fischer claims for this method that it prevents the tampon from becoming soaked loose by the urine, and that it keeps the urine from coming in contact with the fresh wound cavity.

C. D. HOLMES, M.D.

MISCELLANEOUS

Lowsley, O. S., Morrissey, J. H., and Ricci, J. V.: *The Use of Gum-Glucose Solution in Major Urological Surgery.* *J. Urol.*, 1921, vi, 381.

The authors emphasize the importance of a decrease in the blood pressure as an evidence of developing shock. In forty cases they maintained the blood pressure by the intravenous use of gum-glucose solution. In selected cases it was given during operation, and in others was given afterward. It was introduced into the vein not faster than 25 c. cm. per five minutes, according to the body weight. The noticeable clinical phenomena following its administration were the maintenance of the blood pressure, increased diuresis, increased thirst, the absence of nausea, and increased passage of flatus. The solution has no hæmolytic or agglutinative action.

There were no deaths among the patients who were treated in this manner but one of them experienced a severe chill. The preparation of the solution is described in detail. H. G. HAMER, M. D.

SURGERY OF THE EYE AND EAR

EYE

Sinskey, H. L., Levin, M. B., and Sacks, B.: Episcleritis—A New Method of Approach. *Arch. Ophthalm.*, 1921, i, 526.

In a case which had been investigated by several other physicians previously, the usual possible causes having been completely eliminated, the effects of eight different diets were tested. Some of these diets were given twice and each one was used over a period of three days. At the end of each interval blood and urine analyses were made, the results of which are recorded in a table and are apparently of little significance. During the time the patient was on a diet of vegetables or fruit the local condition in the eye was markedly improved, but during the tests with full diets, diets rich in certain carbohydrates, and diets rich in fat the condition remained stationary or became worse.

The authors give three possible explanations for their findings:

1. That carbohydrates absorbed into the blood stream were directly responsible for the symptoms.
2. That the protein element in the carbohydrate foods was responsible.
3. That the ingestion of the offending carbohydrate foods deranged the intestinal digestion and caused the absorption of toxic substances which in some way were related to the production of the ocular condition.

They are inclined to favor the third possibility, particularly as tests of cutaneous hypersensitivity with sixty proteins were without a positive reaction.

THOMAS D. ALLEN, M.D.

Colombo, G. L.: Bilateral Changes of the Cornea in an Airman. *Brit. J. Ophthalm.*, 1921, v, 553.

During a flight in a mountainous region, an aviator, 23 years of age, stayed for hours at a temperature of 25 degrees C. and lost the glasses of his protecting spectacles. The height reached was 4,500 meters. The loss of the lens was followed by a strong sensation of cold accompanied by brief lachrymation. At first he had considerable difficulty in keeping his eyes open but later could do so easily. The lachrymation had then ceased and there was a sensation of dryness with gradually diminishing acuity of vision. Vision became so poor that, on descending at the end of the flight, he could not find the starting point to which he should have returned as he was unable to distinguish any object with the right eye, and with the left eye could see only with considerable difficulty. Twenty minutes after his descent vision was 20/200 in the right eye and 10/200 in the left. The right cornea was diffusely opaque like ground glass, especially in the center. The opacity

was in the superficial layers of the cornea, the epithelium of which was slightly swollen at the center and loosened. Corneal sensitivity was unaltered. Some bulbar and pericorneal injection was noted. The findings in the left eye were similar except that there was no loosening of the corneal epithelium. The skin of the cheeks and nose showed frost-bite of the first degree. Four days later both corneae were normal and full visual acuity was regained.

The author reviews similar cases reported. He believes that in his own case the necessity of keeping the eyes open resulted in analgesia from the cold such as occurs in the freezing of other parts of the body, and that consequently the demand for lachrymal secretion was decreased and the cornea was insufficiently moistened. In addition, the air resistance at the rapid rate of speed probably exerted a traumatic effect.

THOMAS D. ALLEN, M.D.

Peter, L. C.: Obscure Forms of Posterior Uveitis; Their Relation to Sinus Diseases and Especially the Lessons to be Learned Therefrom. *Pennsylvania M. J.*, 1921, xxv, 151.

In cases of uveitis a careful study of the sinuses, particularly the posterior ethmoids and sphenoids, is essential even though they may appear normal on inspection. A case is cited in which a diagnosis of tuberculous uveitis was made. Tuberculin treatment was given but was without effect. Two rhinologists made a negative report, but examination by a third revealed well advanced disease of both sphenoid and posterior ethmoid groups with apparent occlusion of the ostia. Operation confirmed the diagnosis.

The author states that sinus disease as a possible etiological factor should be borne in mind in the treatment of every case of obscure uveitis. When a diagnosis of tuberculosis has been made and the usual tuberculin treatment has failed, sinus drainage will often assist materially. Peter quotes Thomson as follows: "The posterior ethmoids and the sphenoids must be well opened and good drainage established. To the rhinologist it seems as if he were operating on normal tissues. No pus nor exudation is found and no evidence of sinus disease. Soon after operation, however, the ocular condition shows signs of improvement."

THOMAS D. ALLEN, M.D.

Hektoen, L.: The Specific Precipitin Reaction of the Lens. *Am. J. Ophthalm.*, 1921, iv, 909.

Hektoen has done considerable work on the specific precipitin reaction of the lens. So far as is known, the lens is the only organ in the body which has this specific property. The lens of one animal is the same as that of another although other organs

differ. The lenses of mammals, birds, the amphibia, and fish have been studied. A lens antiserum produced, let us say, by injecting a rabbit or guinea-pig with beef lens, will react in precipitation, anaphylaxis, and complement-fixation tests not only with beef lens but also with the lens of other mammals, of birds, and of the amphibia. With fish lens, however, the reaction is very faint. The specificity of the reaction is determined, not by species, as in other immune reactions (blood, serum, bacteria), but by the organ from which the antigen is derived.

THOMAS D. ALLEN, M.D.

Gifford, H.: Late Traumatic Detachment of the Retina. *Am. J. Ophthalm.*, 1921, iv, 803.

Gifford complains that practically all authors of ophthalmic textbooks have failed to appreciate properly the relationship between an injury and subsequent detachment of the retina. He reviews a number of cases. In the first, detachment occurred four years after an injury from a sling shot. In another case, eleven years previous to his examination one eye had been injured by a blow with a piece of rubber hose; at the time Gifford examined him the patient was uncertain which eye had been hurt but in Gifford's opinion it is not unreasonable to regard this as a case of late traumatic detachment.

On the basis of his experience with a number of such cases Gifford concludes that it is best to apply prophylactic measures at the time of the injury. He keeps the patient in bed or sitting at ease with both eyes slightly bandaged for at least one week, and causes sweating by the administration of salicylate or pilocarpin. He warns the patient of the possibility of detachment of the retina and advises him to avoid occupations or games involving much chance of bumps or jolts. With regard to disability insurance, etc., he advises the patient not to settle for damages or compensation except on a contingent basis with full recognition in writing of the possibility of future loss of sight from late detachment.

THOMAS D. ALLEN, M.D.

Holth, S.: A New Technique in Punch Forceps Sclerectomy for Chronic Glaucoma: Tangential and Extralimbal. Iridencleisis Operations Epitomized 1915-1919. *Brit. J. Ophthalm.*, 1921, v, 544.

The author aims to produce a subconjunctival tunnel into the anterior chamber which will stay open and drain. The indication is chronic glaucoma, with or without repeated acute phenomena but without marked iridocyclitis. The technique described is well illustrated.

An incision is made through the conjunctiva and subconjunctival tissues 10 mm. from, and concentric to, the limbus, under the upper lid and slightly on the temporal side of the vertical meridian. The conjunctival incision does not approach the limbus at any point closer than 5 or 6 mm. The conjunctiva is undermined toward the limbus and a keratome is inserted into the anterior chamber 2 mm. from the corneoscleral juncture. With a strong light from

below, Holth watches the point of the keratome as it enters the anterior chamber. A 4-mm. incision is made and the keratome withdrawn obliquely so as not to injure the capsule of the lens. Usually the iris follows into the wound and he cuts the pupillary sphincter. He tries to leave in the wound a small portion of each pillar of the iris. Cutting the pupillary sphincter tends to keep the pupil from being drawn upward.

In a modification of this operation Holth introduces a punch forceps into the anterior chamber at the nasal side of the keratome incision and punches out a portion of the sclera, 3 by 1 mm., tangential to the limbus and 1 mm. from it. Then, instead of drawing out the iris and cutting the pupillary sphincter, he does an iridotomy at the extreme periphery.

He claims that in both of these operations late infections are practically done away with as the wound is covered by more conjunctival tissue than following trephination; none of the cornea and only a portion of sclera, including Descemet's membrane, the canal of Schlemm, and some of the insertion of the ciliary muscle is removed; and the ciliary body itself is not exposed. A shallow anterior chamber does not constitute a contra-indication.

THOMAS D. ALLEN, M.D.

Gifford, H.: Peripheral Iridotomy (Curran) in the Treatment of Glaucoma. *Am. J. Ophthalm.*, 1921, iv, 889.

This article sums up the conclusions reached by Gifford on the basis of thirty operations and describes the technique. The latter is as follows:

A Knapp knife needle is passed into the anterior chamber at the limbus with the cutting edge toward the limbus; the point engages the iris near the periphery with one whipping stitch and the bridge of the iris is cut by passing the knife toward the spaces of Fontana.

In almost every case the tension has been reduced but the time since the operation has been insufficient to warrant conclusions as to the permanent results. It is assumed that in glaucoma the flow of aqueous at the pupillary border of the iris is obstructed. One case in which the ordinary iridectomy had been performed without success was relieved by an iridotomy. The author suggests that this method be tried in all cases of glaucoma, particularly when there is a strong tendency to ocular hæmorrhage. In many cases atropine is used freely after this operation.

THOMAS D. ALLEN, M.D.

EAR

Lasagna, F.: Alterations of Orientation in Labyrinth Lesions and of the Central Nervous System. *Laryngoscope*, 1921, xxxi, 922.

Lasagna accepts as axiomatic the propositions of De Cyon that stimulation of the semicircular canals results in the sensory experience of change in direction and that this sensory experience is of primordeal

origin. He further quotes De Cyon to the effect that the inability of the rotated subject to determine the direction of rotation accurately in the dark is due to the change of the planes of the canals. Moreover, the frequency of errors in direction seems to be altogether independent of the nature of the stimulus.

The three semicircular canals correspond to the three fundamental directions, namely, horizontal, vertical, and anteroposterior. The exact orientation and the execution of change in direction by the organism is accomplished under the control of the canals.

Von Stein's method of examination of static orientation consists of: (1) standing on the toes of both feet, (2) standing on the ball of one foot, (3) the use of the Goniometer, and (4) orientation of the head and body with a stick in regard to the vertical or the horizontal plane. His examination of dynamic orientation consists of walking, jumping, turning, etc. According to Lasagna, the static tests show that a patient with a lesion of the labyrinth falls or sways, and the dynamic tests show that he inclines toward the diseased side.

Marie and Behague have shown that a deep lesion of the frontal lobe of the brain may result in

profound disorientation. This is manifested by the inability to turn to the right or left, to walk toward a fixed object and reach it, and to find the way about a room. The caloric test of the labyrinth elicited normal responses. There was no tendency to fall with the eyes shut. Marie's explanation of this observation is that the lesion involves the associated fibers that start from this lobe and go to the Rolandic, occipital, and temporal zones, "forming the angulus and the unciformis." Lasagna cites a case of his own, that of a wounded soldier with an injury involving the right frontal lobe. Lying in bed at the end of the ward, the patient could not make out whether the wall was on the right or left side, and in walking from the treatment room he turned to the right instead of to the left. In trying to get to a fixed point he often turned around and failed to reach it. The labyrinth tests revealed a normal labyrinth.

In conclusion Lasagna points out that while the semicircular canals have to do with static and dynamic orientation, the sense of proper orientation in space requires the functioning of the frontal lobes of the brain or of some definite portion of those lobes.

FRANK J. NOVAK, JR., M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Heller, I. M.: Peritonsillar Abscess and Its Radical Treatment. *N. York M. J.*, 1921, cxiv, 642.

Heller advises removal of the tonsils during the attack. A certain armamentarium is necessary. The mouth-gag must be well fitting and have an attached tongue depressor and an anæsthetizing tube along its dorsal surface. Such a gag not only holds the jaws well apart, but controls the tongue and allows the administration of a steady flow of vaporized ether without interruption. Other essentials are a combined electric suction and etherizing pump with a tube attached to the dorsal tube of the tongue depressor and an electric head mirror. No operation should be attempted without these implements in good working order. The remaining instruments are those ordinarily used in the dissection operation.

The affected side is attacked first. A small incision is made in the plica triangularis as low as possible, just behind the anterior pillar, with a sharp pointed knife. However great the swelling, this small space can always be found by pressing the base of the tongue downward and forward. In this slit, a dull-pointed but sharp-edged knife is inserted and carried upward to the dome of the tonsil. The dissection is then continued between the tonsil and pillar so that on retraction of the latter almost all of the anterior surface of the gland is brought into view. So far, the pus is not seen because it lies behind the tonsil at its upper pole or has gravitated below.

The dissector is then carried into the superior fossa. Here pus will be found. When the pus begins to escape it is taken up with the suction tube as it exudes. When the exudation has ceased, the tube is slipped to the base of the abscess cavity and every remaining drop of pus is drawn up. When it is certain that the abscess is empty the operation is continued as an ordinary tonsillectomy.

If the condition is of more than three days' standing, the posterior surface will be found already dissected by the pus. All that then remains to be done is the separation of the attachment of the posterior pillar and the clipping of the tonsil at its base with a snare.

The fossa is swabbed with a weak alcoholic solution of iodine. If desired, the second tonsil may be removed also as it is rarely found free from infection. The author states that in operating on his first cases he feared to remove the second tonsil but subsequently found that it did not increase the risk and therefore now does it as a routine measure unless there are special contra-indications. The bleeding is always less on the inflamed than on the non-affected side because of the greater or less occlusion

of the surrounding vessels in the former due to continued pressure.

Recovery is marvelously prompt as far as symptoms of quinsy are concerned. All the acute pains radiating to the ears and the choking sensation on deglutition disappear. In their place is the sore throat of a tonsillectomy. To most patients this is a decided relief. The after-treatment and recovery are about the same as in cases of uncomplicated tonsillectomy.

O. M. ROTT, M.D.

MOUTH

Kazanjian, V. H.: Plastic Surgery of the Lip. *J. Am. M. Ass.*, 1921, lxxvii, 1959.

Before any major plastic operation is attempted, sepsis must be controlled and the vascularity of the tissues must be increased as much as possible. A scar left by sepsis must be excised in order that healthy tissues may be approximated. It is often best to wait for healing before attempting the main operation.

The underlying supporting structures should always be in place before the reconstruction of the soft tissues is begun, and all preliminary operations should lead up to the main procedure.

To fill a gap, tissue is usually taken from the immediate vicinity. To replace a loss of tissue near the median line of the lip the author takes quadrilateral flaps including the remaining portion of the lip from each side of the gap, and such other tissues as are needed from the immediate neighborhood. Because of the contraction following the operation it is better to make the flap too large than too narrow.

In cases of unilateral destruction of the lip the flap is taken from the opposite lip. By this method adequate tissue can be secured and the two lips are made more equal in size.

In cases of extensive bilateral destruction the author has obtained excellent results by transplanting flaps from the sides of the opposite lip. This method supplies plenty of tissue. Its main disadvantage is the alteration it causes in the contour of the face.

In the correction of deformities at the corners of the mouth all scar tissue is excised, the corners of the red border are joined together, and the space left by the excision is filled in with supporting flaps from above or below, or both.

J. C. BRASWELL, M.D.

Brown, G. V. I.: The Nasal Relation of Harelip Operations. *J. Am. M. Ass.*, 1921, lxxvii, 1954.

In the surgical treatment of harelip the natural anatomical relations should never be disturbed in

an effort to close the lip fissure by transposing tissues or destroying underlying bone structures.

Surgical correction must contemplate the readjustment of the parts to their rightful position and the restoration of functional activity in such a manner as to give hope for continued movement.

In performing first operations for harelip care must be taken not to make the lip too long as the consequent defect has a tendency to increase as time goes on and in many cases symmetrical shortening of the lip becomes a matter of difficulty.

In third-degree cases the author uses a metal splint to straighten the nasal septum. This is placed against the septum on the side opposite the fissure and is attached to a silkworm-gut suture carried across below the naris and out under the skin surface on the affected side at a point just below the outer angle of the ala where it is secured by a metal button placed over adhesive plaster laid on the skin. The flattened alar cartilages are rounded up, divided parts are held in close contact, and tension is relieved.

Care is necessary in forcing the projecting premaxilla into better alinement at the time of operation as the destruction of unerupted teeth means more or less permanent injury to the growth of the parts.

In correcting defects from a previous operation in cases in which the lip is too long the author has obtained good results by excising tissue just above the prolabial border, so that no perceptible scar will be apparent. The incision is made to slant obliquely from the skin surface downward toward the mucous membrane in order to thicken the lip as where approximation is accomplished the prolabium is drawn up over the deeper tissues. The natural outward roll is restored.

When the philtrum of the lip is destroyed and there is loss of the underlying structures that support the lip a vulcanite support attached to a plate fitted to the mouth and extending up as far as necessary has been used with good results to hold the lip upward and outward.

J. C. BRASWELL, M.D.

Moorehead, F. B.: The Correction of Congenital Cleft Palate and Harelip: Surgical Principles Involved. *J. Am. M. Ass.*, 1921, lxxvii, 1951.

Congenital cleft palate should be corrected as soon as surgical treatment is permitted by the child's physical condition. As a rule this is from six to ten weeks after birth. The first and major problem is that of feeding; the pediatrician has much to do with the end-results. Feeding may be carried on with a spoon or medicine dropper of suitable size. The nipple should not be used as sucking causes a certain amount of bone separation which produces the characteristic low, flat, broad nostril.

The care of the wound is a minor incident and handled most satisfactorily by the open method. Apart from the danger of infection, a dry wound is always preferable to a moist wound. Tension should be relieved by proper and adequate flap preparation rather than by postoperative or even pre-operative dressings and devices. On the third day the removal of sutures should be begun, one or two being removed at a time and strategic sutures being left for seven or eight days.

In the operative treatment, the jaw, nose, and lip must be considered. The first step is complete anatomical restoration. This is accomplished by immediate molding. The lip and cheeks are dissected from the bone sufficiently to permit proper shaping of the nose and lip without tension. A single wire suture is used to transfix the bones. The bones are molded to close the cleft, to restore proper relationship between the arches, and to bring the nose in the median line of the face. The correction of the nasal deformity is solved when the bony arch is corrected. In correcting the lip it is necessary to consider the proper relation of the skin and mucosa.

The author states that a low, flat, broad nostril after the operation is due to several factors: incomplete reduction of the long segment, depression of the short segment, incomplete preparation of the soft tissues, the use of a nipple, and sucking of the thumb.

J. C. BRASWELL, M.D.

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INTERNATIONAL ABSTRACT OF SURGERY

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COLLECTIVE REVIEW

THE PROGNOSIS AND TREATMENT OF PUERPERAL INFECTION

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THE prognosis and treatment of puerperal infection are dealt with together because they are intimately related. Localized peritoneal infections are not considered in this discussion.

The treatment of acute puerperal infection has been the subject of much controversy because at the time of the appearance of the first symptoms it is impossible to establish an exact prognosis. Moreover, it seems difficult to find a method of treatment sufficiently exact for the establishment of a prognosis.

This subject has been recently studied by Couinaud, Director of the Clinic on the service of Brindeau. With Clogne, Chief of the Laboratory, Couinaud has investigated the prognostic importance of the chemistry of the blood in cases of puerperal infections. He writes: "The prime importance of the estimation of the prognosis in the study of puerperal infections is evident as all of the present-day surgical procedures are dependent upon it."

It is evident that if the infection is very severe it is of the utmost importance not to temporize. On the other hand, if it will evolve favorably, haste in the treatment may be responsible for useless mutilation. Therefore a review of the means at our disposal by which we may rapidly establish a prognosis based on the degree and the type of the infection and the organic resistance is in order.

These methods are of two kinds, clinical and laboratory. From the clinical standpoint it is necessary first to distinguish puerperal infection from infection due to abortion. The latter is

generally much more serious than the former, particularly in cases of criminal abortion.

Clinically, considerable valuable information may be obtained from the history and etiology. If the conditions of the accouchement are known, the severity of the infection may be surmised. A patient delivered under unfavorable conditions, with some obstruction to labor and doubtful sepsis, and who presents the signs of infection is menaced by a very severe septicæmia. The date of the onset of the infection has also been suggested as an element in the prognosis since a sudden onset is usually characteristic of the serious type of infection.

Decided oscillations in the temperature and a very rapid pulse tending to exceed the temperature curve have been pointed out as factors indicating an unfavorable outcome, but in some cases the symptoms are deceiving. The foetidness of the lochia is not necessarily a sign of serious infection. Often one sees a patient with foetid lochia who does not present symptoms of general infection and, on the other hand, infection has occurred in cases in which the lochia had little odor.

The patient's general condition gives more exact information; severe and repeated hæmorrhages, albuminuria, and physiological distress are unfavorable signs. In the presence of the symptomatic triad of dryness of the tongue, profuse diarrhoea, and icterus the prognosis is very poor. However, none of the methods of clinical investigation at our disposal furnishes accurate data upon which we may rely with certainty. In this condition, as in others, the clinical findings

must be evaluated with the bacteriological and chemical laboratory findings.

Bacteriology permits us to study the types of bacteria in the lochia collected within the uterine cavity. This examination, however, is of only relative value as occasionally many types of bacteria are found. Since the work of Widal and Fabre, it has been known that puerperal infection is due to numerous bacteria, but that only one of all those within the uterus, usually the streptococcus, is responsible for septicæmia. Therefore a bacteriological examination of the blood is also of great importance. The discovery of the same bacterium in the blood establishes the cause of the infection.

The infections due to the hæmolytic streptococcus are very serious but the presence of streptococci in the blood is not necessarily the sign of a fatal septicæmia as cases of puerperal infection with positive blood cultures have become cured while others with negative blood cultures have been fatal. Moreover, there are streptococcal infections which recover and infections due to other micro-organisms which cause death. The statistics of Cathala prove this fact. In the nine cases on which these statistics are based the blood cultures were negative in four; three terminated in recovery and one in death. Of five cases with positive blood cultures, three were cases of streptococcal infection and two were cases of staphylococcal infection. Of the three streptococcal infections, two ended in recovery. Of the two staphylococcal infections, one was fatal. Therefore, at best, the methods of investigation are imperfect.

In recent years the chemical composition of the blood in infections has been studied. Couinaud and Clogne on the clinical service of Brindeau at the Hôpital de la Pitié attempted to determine whether, in puerperal as well as in other infections, the severity of the prognosis is related to a high nitrogen content. According to their findings it appears that an increase in the blood urea associated with an increase in the residual nitrogen may be related to the infection and only to the infection. This increase appears to be proportional to the gravity of the condition. Couinaud and Clogne believe that the increase in the nitrogen content is due to poor renal and hepatic function. It cannot be due to the phenomenon of uterine regression since in cases of normal delivery no increase in the blood urea was found. It is possible that better aids in the prognosis might be discovered by a careful study of the condition of the liver and kidneys. At any rate the fact that the increase in the urea is propor-

tional to the gravity of the infection is of prognostic importance. Unfortunately the number of observations is still much too small to warrant definite conclusions and it must be admitted that in the present state of our knowledge there is no clinical symptom or laboratory method which will permit us to foretell the outcome of a puerperal infection at its onset. Hence the indecision which has persisted for a long time regarding the methods to be employed in combating the septicæmia.

The treatment of puerperal infection is a question of very great importance since the incidence of the condition is relatively high (10 per cent) and it is a serious infection. The mortality as given by various authors varies from 21 to 51 per cent. The methods of treatment are numerous and one may say that all of them have succeeded in certain cases and all have failed in others.

The treatment of puerperal infection has passed through many phases. At one extreme is the period of radical uterine intervention and at the other the use of local therapy consisting of curettage, sponging, cauterization, and intra-uterine lavage.

Instrumental curettage with a sharp curette was very soon abandoned. In removing all of the uterine mucosa the sharp instrument traumatizes the internal surface of the infected uterus and the curettage is stopped only when grating is felt (the "uterine cry"). The barriers formed by the endometrium are broken down and new avenues of infection are opened. This treatment is to be rejected also in cases of endometritis. It is unreasonable to expect to remove all the infected portion by means of the curette, and such scraping causes bacterial reinoculations. The remaining healthy portion of the mucous membrane must be respected. According to Potvin of Brussels, the number of deaths caused by scraping the internal surface of the uterus to remove the mucosa is greater than the number of lives it has saved.

As a substitute for instrumental curettage Budin has recommended digital curettage which thoroughly cleanses the uterus and is much less traumatizing. Certain gynecologists, however, object to digital exploration as it is very painful and nearly always requires general anæsthesia; they prefer instrumental curettage with dull instruments. Many use a simple tampon grasped in a forceps with which they sponge out the uterus. Horsehair and feather sponges have been abandoned because of their very traumatizing action. At the last Congress in Paris, Potvin

proposed the use of a forceps curved upon the flat for this procedure. Obstetricians who once routinely practised various methods of cleansing the uterine cavity often followed the curettage with intra-uterine cauterization and drained the uterus by means of Mouchotte metal drains, Croisier drains, or ordinary rubber drains. At present, drainage is employed only when the uterus is so markedly flexed that the flow of lochia is obstructed.

At the Congress in Paris in 1921, Audérodias of Bordeaux proposed intermittent irrigation by the Carrel method. He cited statistics of 152 cases of infection in which there were 133 cures. Curettage has been much discussed recently. It has its advocates and its enemies. Many gynecologists do not practise curettage unless they observe the signs of placental retention—incomplete uterine regression, a large, soft uterus with a gaping cervix. Others practise it systematically at the first symptoms of infection, even when there are no definite signs of retention. They believe that there always remains a slight residue of decidua which may cause an elevation of temperature. All agree in advocating a non-traumatizing exploration without an attempt to remove the uterine mucosa.

The period in which uterine intervention was advocated was followed by a period in which, in addition to local treatment, measures were taken to combat the general infection. Attempts were made to cleanse the blood by means of intravenous injections of serum in massive doses. Later, injections of colloids were given for the same purpose. As a rule collargol and electargol were used, but many other colloids were also employed. More recently the use of salvarsan has been proposed. In certain cases the injections have seemed to favor the rapid termination of the infection. It appeared that whenever it was possible to cause a classical colloidal shock there was a certain degree of amelioration, but from the standpoint of a more favorable effect there was much disappointment.

It was during this same period that the practice of abscess fixation, Fochier's method, was begun. This also seemed, in certain cases, to have a favorable effect on the course of the infection.

About the same time that the colloids were in vogue, Pinard and, following his lead, a certain number of obstetricians, attempted to combat the infection by means of the antistreptococcus serum of Marmorek. Very often this is without effect. At the present time we are using a similar method but use vaccines instead of sera. As a

rule, stock vaccines are employed as in puerperal septicæmia there is no time to prepare an autogenous vaccine.

In January, 1921, Lequeux, Lafont, and Chomé made use of Le Moignie's vaccine, an oily solution of streptococci. Statistics show that it has been employed in the treatment of infection that has already developed and as a preventive of infection. The impression has been gained that in infections of moderate virulence it has had a favorable influence. In the virulent types it does not appear to have had any influence whatever upon the disease. In ninety-three cases in which vaccine was employed as prophylactic treatment there were no cases of streptococæmia although thirty-two of the women had complicated deliveries.

Recently Delmas has used subcutaneous injections of the blood serum of patients convalescing from puerperal infections. In judging this method as well as those which preceded it one must take into consideration the poor results as well as those which are favorable.

Regarding the surgical treatment of puerperal infection, obstetricians and gynecologists are not in agreement. There are both abstentionists and those who advocate surgical procedures. The abstentionists content themselves with applying ice to the abdomen, detoxicating the organism by increasing evacuation, and stimulating the body by the usual methods, such as the injection of camphorated oil, spartein, adrenalin, strychnine, physiological salt solution, glucose, and hyperglucose solutions. Certain obstetricians give hepatic extract in the belief that the function of the liver plays the chief rôle in the organic defense.

The advocates of surgical procedures propose to free the body from the initial focus of infection by performing a hysterectomy. Before discussing hysterectomy a word should be said regarding the operation of Trendelenburg and Freund, viz., ligation of the thrombosed veins. The first operation of this kind in France was performed by Faure in the Tarnier clinic. Recently, Lequeux and Chomé reported to the Obstetrical Society a case of puerperal pyæmia in which they effected a cure by this procedure. The value of a surgical operation in the presence of puerperal pyæmia was discussed by Jeannin, Vauverts, and Pocot in a report to the Obstetrical Society of France in 1912. According to the conclusions of this report, intervention is justified only in the following cases:

1. Those in which thrombophlebitis is not associated with extravascular lesions.

2. Those in which localization to the veins of the pelvis permits intervention below the thrombosis in the healthy parts of the venous system.

Lequeux and Chomé reported that in their cases these two conditions were not present; that, in fact, there existed in addition to the thrombophlebitis a lesion of the adnexa characterized by infiltration of the broad ligament with foci of walled-off suppuration. Moreover, the thrombophlebitis of the utero-ovarian veins extended too high to permit the application of the ligature below the lesion and the ligature was therefore placed entirely about the thrombosed area. In spite of these unfavorable conditions the patients recovered. A certain number of observations of this kind would evidently encourage intervention in a greater number of cases of pyæmia.

The question of hysterectomy in cases of puerperal septicæmia is one of those which have been discussed widely by obstetricians and gynecologists in the last few years.

The first hysterectomy for puerperal infection was performed by Schulze of Jena in 1886. This was not the vaginal type of operation but the abdominal type. Subsequently the question was not taken up again until 1895 when Winterberg, a pupil of Bouilly, advised intervention in cases of infection not yet generalized.

The same year the question was discussed at the forty-sixth meeting of the American Medical Association. Intervention found defenders in Smith, Peterson, and Noble, but was opposed by Da Costa and Price. Since then hysterectomy in puerperal infections has been the subject of much controversy, being accepted by some and rejected by others.

In 1901, intervention was again championed by Tuffier before the Surgical Society of Paris, and by Demelin and Jeannin before the Obstetrical Society. They were supported by Terrier, Faure, and Quénu. Ricard, Budin, and Maygrier were opposed to the operation.

At the Congress in Rome in 1902 and at Madrid in 1903, hysterectomy was again the subject of the day. It found partisans in Tuffier, Bumm, Latzko, Mackenroth, and Cortiguera. Pinard, on the contrary, declared that a rational indication for it does not exist in puerperal infection. The subject was discussed also at the last Obstetrical Congress in Paris.

Potvin of Brussels proposed hysterectomy in the following conditions:

1. When it is certain that the uterus is empty, that no other affected organ is the cause of the continuation of the infectious process, and the

septicæmia arises from deep infection of the mucosa and submucosa of the uterus.

2. When the puerperal infection is not caused by placental retention but is due to an external infection entering the uterine wound and causing an endometritis of the streptococcus, staphylococcus, gonococcus, or colon bacillus type.

Potvin stated that under such circumstances the removal of the infected organ is indicated because there is as yet no method of medical treatment by which the condition can be combated successfully. He insists that hysterectomy should never be performed *in extremis* for if it is done too late it only hastens death.

Potvin, as well as others who are defenders of hysterectomy, regards vaginal hysterectomy as the procedure of choice. As compared with the abdominal hysterectomy, this operation, which has been recommended by Faure for thirty years, presents the advantages that it is more rapid and less shock-producing, prevents the dissemination of infection to the abdominal peritoneum, and favors drainage. Abdominal hysterectomy is to be performed only in the presence of contra-indications to the vaginal operation, that is, when difficulty in pulling down the uterus is anticipated, when a phlebitis has developed in the utero-ovarian veins, or when the infection has passed the pelvis and is spreading toward the abdominal peritoneum. Under such circumstances intervention by the abdominal route is justifiable.

Cotte of Lyons has arrived at analogous conclusions regarding the indications for hysterectomy. He admits that in the present state of science, with the exception of cases in which there is a lesion of the uterus demanding immediate ablation, hysterectomy cannot be proposed at the beginning of the outbreak of the infection because at this time there is no clinical or laboratory means by which we can foretell with certainty the seriousness of the infection. He advocates intervention in the following types of cases:

1. Cases of acute, prolonged, remittent infection which so often leads to a fatal issue through secondary septicæmia or pyæmia.

2. The acute forms following abortion, particularly criminal abortion.

3. Cases of primary acute puerperal septicæmia.

In such cases, on the basis of our medical as well as our surgical methods, Cotte believes that intervention may be performed because the septicæmia may be dependent upon an undiscovered local lesion.

Cadenat is also a defender of vaginal hysterectomy. The question of mutilation, he says, ought not to be considered when the mother's life is threatened. In the vaginal hysterectomy shock is reduced to the minimum. The objection that the operation is useless is not valid unless it is performed too late.

Cadenat rejects intervention in certain cases of hyperseptic infection. In these, he believes, nothing can be done. For the ordinary acute or subacute forms he advocates operation based upon the following conditions: the stage of the pregnancy (infection is more serious the nearer the pregnancy to term), elevation of the temperature, slight abdominal contraction, pain in the cul-de-sac of Douglas, and a negative blood culture. If all these conditions are late or accentuated, operation should not be performed because it may be too late or the body may be beginning to recover from the infection.

Regarding the time at which operation should be done Cadenat agrees with Faure that intervention is indicated if, twenty-four hours after a uterine exploration, there is no amelioration, fever persists, the pulse is rapid, and the patient complains of chills.

Brindeau is not as enthusiastic regarding intervention. As puerperal infections often recover

spontaneously (140 out of 175 cases), he does not agree with Faure. He believes in differentiating postpartum infections which involve the entire organism from postabortum infections which remain well localized in the true pelvis. In the latter, intervention is indicated, while in the former it is contra-indicated except in cases of uterine laceration and gangrenous fibromata.

Wallick supports the theory expressed by Pinard in 1903 with regard to the absence of indications for hysterectomy and states that this still holds true to-day.

From this review it appears that Faure is correct in the belief that the question is still undecided. On the basis of the etiological facts and the clinical and laboratory findings certain gynecologists and obstetricians make deductions regarding the prognosis and the indications for operation, but these deductions are subject to variations entirely personal. In cases with identical symptoms and laboratory findings some will operate and others will not. The procedure depends entirely upon the surgical tendency of the gynecologist or obstetrician, and it seems evident that the treatment of acute puerperal infection will not be definitely settled until facts permitting the establishment of a definite prognosis are furnished by the clinic and the laboratory.

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

ASEPTIC AND ANTISEPTIC SURGERY

Rector, F. L.: Iodine as a Wound Disinfectant.
Nation's Health, 1922, iv, 38.

The author states that the use of iodine as a disinfectant for the skin, particularly for the field of operative surgery, came prominently before the public in 1905. Among the first to introduce it to the profession were Cannaday, Woodbury, Dannreuther, and Grossick. Grossick was the first to write comprehensively on the subject.

The undiluted tincture and a 20 per cent solution were first employed. Experimenting to find the proper strength for routine use, Bovee and Neate of America and Turner and Catto of England came to the conclusion that a 3 to 3.5 per cent solution was best. Kinnaman found that a 0.2 to 1 per cent solution was far superior to bichloride of mercury. Schantz in 1908 claimed that the irritation caused by the solution stimulates healing so that a smaller scar results. Schantz paints small wounds on the third and fifth day; large ones daily.

Of the sixty-five physicians replying to a questionnaire sent out recently, two use a 10 per cent solution; eighteen, a U. S. P. 7 per cent tincture; twenty-one, a 3.5 per cent (50 per cent U. S. P.) tincture; ten, a 3 per cent tincture; three, a 2 per cent tincture; and eleven, a 4 or 5 per cent solution. Several emphasized the importance of having the surface dry before applying the tincture, and recommended the use of alcohol and ether as final cleansing agents before the application of the iodine. Grease may be removed with gasoline or benzene.

Objections to the use of the tincture were: (1) the danger of burning, and (2) the sealing of punctured wounds and the formation of a crust on the more extensive wounds which delays healing. The use of bichloride of mercury following the application of iodine is said to be harmful.

EARL K. LANGFORD, M.D.

ANÆSTHESIA

Glass, S. J., Jr., and Wallace, H. S.: Pre-Operative Treatment for Postoperative Comfort: Report of Synergistic Anæsthesia. *J. Am. M. Ass.*, 1922, lxxviii, 24.

Five years ago in the urinalyses made in a series of laparotomy cases the authors found acetone in 60 per cent and diacetic acid in 25 per cent during the first twenty-four hours after operation. A routine was then inaugurated by which, when possible, every patient was given before operation

15 gr. of sodium bicarbonate and 5 gr. of lactose every four hours for six or eight doses. In these cases the urine was alkaline and the amount of acetone bodies was reduced but not entirely eliminated. The patient's general condition was improved, nausea being less, and not one in the series showed severe acidosis.

Gratifying results were obtained with the synergistic method of Gwathmey with preliminary alkaline treatment in a series of cases in which ether was used to induce general anæsthesia. The technique consisted of alkaline treatment with sodium bicarbonate and lactose for several days before the operation. The immediate pre-operative treatment consisted of a hypodermoclysis of 200 c. cm. of a 4 per cent chemically pure and sterile solution of magnesium sulphate given one and one-half hours before the operation, and from 1/10 to 1/6 gr. of morphine sulphate in 1.5 c. cm. of a 25 per cent chemically pure and sterile solution of the magnesium sulphate given at fifteen-minute intervals for two or three doses, beginning one and a quarter hours before operation.

There were no deleterious results, such as abscess, necrosis of the tissues, or laxative effect. Glass and Wallace therefore concluded that with the alkaline synergistic method the postoperative condition is entirely altered. Absence of gas, wound pains, and distention, improvement in the appetite, and decreased mental depression make convalescence shorter and more agreeable.

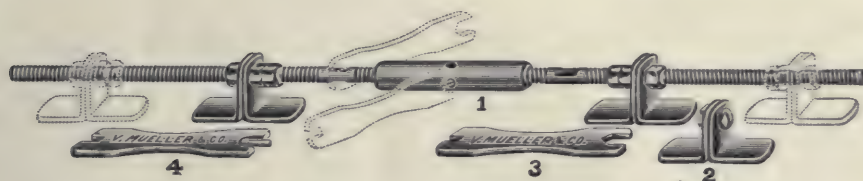
ISABELLA C. HERR, M.D.

SURGICAL INSTRUMENTS AND APPARATUS

Lewis, E. J.: A Turnbuckle Extension Apparatus for the Reduction of Fractures. *J. Am. M. Ass.*, 1922, lxxviii, 108.

Interest in fractures has been stimulated recently by the war and the inquiries of the industrial commissions and compensation boards. Various new methods of treatment have been suggested and tried, especially in the recently established fracture wards of the larger hospitals.

The author has devised a fracture-reducing apparatus consisting of several units. Each unit is made up of two steel rods joined by a turnbuckle with right and left threads extending, except for a short interval, along its entire length, to allow a hold for a wrench. Each unit acts as a truss rod or support for the broken bone as it is locked at each end into an inverted T-shaped anchor post which is firmly set in the plaster. The vertical limb of the anchor protrudes through the plaster and is per-



One of the units. 1, turnbuckle; 2, anchor post; 3 and 4, two forms of wrench.

forated to receive and hold the end of the truss rod by means of a lock nut.

It is usually necessary to use three or four units. By adjustment of the length of the truss rods at the anchor posts and through the central turnbuckle, the angulation and shortening of the bone may be overcome. The finer manipulations may be carried out under the fluoroscope.

Special care must be taken to use sufficient and properly placed padding in the application of the

cast. The joints at the ends of the broken bone should be flexed to a right angle if possible, and the cast extended for some distance above and below the injured part. There is maximum muscle relaxation.

The appliance has been found most useful for transverse and dentate fractures of the tibia, the shaft of the femur, and of one or both bones of the forearm. It is light, compact, economical, and accurate.

DANIEL H. LEVINTHAL, M.D.

SURGERY OF THE HEAD AND NECK

HEAD

Little, J. M.: Observations on the Operative Treatment of Epilepsy, with a Report of Fourteen Cases. *Boston M. & S. J.*, 1922, clxxxvi, 65.

Three cases of Jacksonian epilepsy are reported in detail. One patient had not had a seizure in eleven and one-half years after the operation. The second, during a period of nine years, had been greatly improved, although the seizures continued. The third still had epileptic seizures six years after the operation but they were of a milder form. All three were able to work and support themselves.

Eleven cases were of the general epileptic type and either the decompression of Cushing or the trap-door drainage of the motor area recommended by Krause was performed. All were temporarily benefited. Five died in from eight months to three years after the operation. Three patients were relieved, two had recurrence of the attacks, and one was not benefited.

Eighty-one cases collected from the literature are outlined in a table.

Little does not wish to start the over-enthusiastic surgeon on a career of indiscriminate operating for epilepsy but believes operation is beneficial in some cases. The first essential is the proper selection of cases, and the second, the choice of the proper operation.

CARL R. STEINKE, M.D.

on the morphology of the cerebellum. According to Bolk's morphologic classification of the mammalian cerebellum, cerebellar function is distributed in the cerebellar cortex in accordance with the grouping of the various muscle regions of the body. The regions identified and named by Bolk are considered also as functional entities: the anterior lobe contains the centers of the muscle groups of the head (eyes, tongue, chewing, and mimic muscles) and also those of the laryngeal and pharyngeal musculatures. The lobulus simplex contains the centers for the neck muscles and those of the nape of the neck; the Sublobules C_1 and C_2 of the posterior median lobule, the centers of bilateral synergistic motions of the extremities; the ansiform and paramedian lobules, those of unilateral isolated motions of the extremities; and the Sublobules (A) and (B) of the posterior median lobule and the vermicular formation are the centers for the musculature of the trunk, that is, the back, abdomen, perineum, and tail, respectively.

The clinical and experimental results of others do not coincide with Bolk's results. There were many difficulties to overcome as it is necessary to produce the lesions more or less blindly through trephine openings. The authors' tests were made on dogs, cats, and pigeons. Cortical extirpations within the area of the ansiform lobule resulted in locomotor disturbances in the extremity of the same side in the form of hypermetria, adduction, extension or flexion postures, and spasticity; the muscles of the anterior extremity of the same side are represented in Crus 1 and Crus 2 which contain centers for the muscle synergy of the anterior and posterior extremities of the same side.

Injuries of the paramedian lobule resulted in an apparent inhibition of locomotion and deep or more extensive superficial lesions. A more extensive but

Troell, A., and Hesser, C.: The Problem of Cerebellar Localization (Ueber das cerebellare Lokalisationsproblem). *Acta chirurg. Scand.*, 1921, liv, 211.

The purpose of these investigations was to discover the localization of function in the cerebellum. The starting point was the theory advanced by Bolk which is based on his comparative experiments

transient syndrome was observed which was characterized at first by certain forced positions and forced motions in which large portions of both the extremities and the neck and trunk musculature participated. These symptoms showed that the paramedian lobule not only regulates automatic motions of the extremities of the same side, but represents also muscle synergy constituted by elements of other portions of the body. It is in functional relationship to the musculature of the extremities, especially certain muscle groups of the anterior leg of the same side, but influences also certain areas of the muscle groups of the neck and trunk.

Injuries of the anterior part (Sublobule C₁ and C₂) of the posterior median lobule were followed by transient locomotor disturbances in the extremities, especially the posterior, which were associated with loss of equilibrium and a tendency to abnormal positions and motions of the body. Although the musculature of the extremities, especially the posterior, was represented here, it can hardly be assumed that this is a center for the regulation and co-ordination of bilateral synergistic movements of the extremities.

Lesions of the vermicular formation show abnormalities both in attempts at locomotion and at rest, signifying disturbances of function of the trunk muscles. This formation has a functional correlation with the trunk muscles and influences also other muscle regions (the neck and probably the back, the extremities, and the eye muscles).

Injuries involving the lobulus simplex showed that, as regards function, the neck muscles are not represented exclusively in this part of the cerebellum.

Deep and extensive injuries within the whole region of the posterior lobe caused a marked inhibition of, or indisposition to, walking and standing and certain marked forced lying positions, forced postures, and forced motions. The nature of these signs and the fact that the lesion involves not only the gray cortical matter but also the subjacent white matter make it probable that these disturbances are caused not only by the superficial lesions and the subjacent centers with their projection paths, but also by interruption of association paths, whereby a many-sided functional relationship and an intimate connection between various cell groups and cortical areas are disturbed.

Lesions of the anterior lobule caused no clinically discernible sign with relation to the muscles of the head, pharynx, and larynx but produced disturbances of many varieties, consisting of single, circumscribed, and usually bilateral signs of the extremities (hypermetria and abduction position), marked difficulty in locomotion, and inability to maintain the normal position and equilibrium, in addition to forced positions and forced motions. This lobe has a direct influence upon the musculature of the extremities and cannot be reserved exclusively for the muscle groups of the head and the visceral neck muscles.

In view of these findings, the functional cerebellar localization of Bolk, based entirely upon the morphology, is not verified. The division of the cerebellar cortex according to the large body parts into a number of primary functional centers which correspond topographically to the individual cerebellar lobuli is untenable. The findings made by the authors which corresponded most closely to Bolk's theory are those indicating that the ansiform lobule is a center for the bilateral extremities, but they do not verify his belief that this lobule is reserved exclusively for the bilateral extremities so that all other muscle synergy is excluded from any influence. These experiments showed also many exceptions to Bolk's rule that there is a definite relationship between the morphologic development of the cerebellar lobules and the physiological grade of development of the muscle regions, which Bolk attributes to the respective lobules. The exceptions are the centers of the extremities, such as the anterior part of the posterior median lobule (Sublobule C) which he believes to be an unpaired center for the bilateral synergistic motions of the extremities, and the ansiform and the paramedian lobules as paired centers for the unilateral automatic motions. These findings were not verified in other mammals and man. The same is true of the lobulus simplex and the vermicular formation in the cat and man. This parallelism forms the fundamental basis of Bolk's localization theory, the undermining of which destroys the validity of his entire theory.

L. NEUWELT, M.D.

Williams, T. A.: The Early Diagnosis of Brain Tumor Before Eye Signs Occur. *N. York M. J.*, 1922, CXV, 18.

An hysteriform syndrome is a common initial manifestation of the presence of a new growth in the brain. The difficulty in the diagnosis is complicated by the erroneous statement perpetuated in textbooks that the alteration of the usual fields in these cases is a sign of hysteria. Williams states that inversion of the color fields or restriction of the form field are indicative of physical damage and are not characteristic of hysteria. Another drawback to the early diagnosis of brain tumor is the belief that one must find a swelling of the optic disc and that there must be vomiting and diffuse headache. These symptoms come late and are indicative of greatly increased intracranial tension. A localized headache, however, may be an early sign. Dizziness may be a local sign of a lesion of the posterior fossa, and vomiting may be provoked by a tumor which presses upon the medulla. These tumors are the easiest to locate on account of the abundance of sensory and motor structures traversing the region. The most difficult tumors to detect are those in the cerebrum itself unless they involve one of the sensory or motor areas or the speech area. Another complication making the diagnosis difficult is arterial hypertension. The histories of three cases are reported in brief.

The diagnosis of hysteria may be quite difficult in the absence of physical signs and when erratic behavior is the only symptom. The clinical diagnosis must not be influenced by the erroneous doctrine that physical disturbances may be of hysterical origin.

In encephalitis the most difficult differential diagnosis of all is from the mild acute psychopathies, with or without delirium. In these cases the diagnosis can be made only by watching the course of the disease or discovering a lymphocytosis of the spinal fluid.

CARL R. STEINKE, M.D.

Pette, H.: The Symptomatology and Differential Diagnosis of Tumors of the Cerebellopontile Angle (Zur Symptomatologie und Differentialdiagnose der Kleinhirnbrückenwinkeltumoren). *Arch. f. Psychiat.*, 1921, lxiv, 98.

Pette reports in detail eight cases of tumor of the cerebellopontile angle from the University Clinic for Nervous Diseases at Hamburg and discusses the symptoms and differential diagnosis.

The most common symptom is headache. The area most affected is the region of the tumor, and particularly the back of the head. The patient's statements regarding sensitiveness to percussion of the skull are often very indefinite. Such sensitiveness usually varies with the gravity of the disease. Vomiting is a particularly frequent and early symptom in cases of tumor of the posterior cranial fossa, but may occasionally be absent.

The intensity of the symptoms varies within astonishingly wide limits. Periods when the general condition is at its worst may be followed by periods of improvement, of even complete freedom from symptoms. Psychic changes are rare. The most important general symptom is choked disc. This is found in nearly every case and appears early but cases have been verified at autopsy in which it was absent. The homolateral eye usually shows the more developed choked disc, but the degree of its development gives no clue to the size of the tumor.

The frequency of the pulse is of no particular diagnostic significance. The most important of the focal symptoms indicate injury of the auditory nerve, whether or not the tumor has its origin in this nerve. The auditory nerve symptom is of particular importance in indicating whether the location of the tumor is intra- or extra-pontile. If it is intra-pontile, these disturbances usually do not appear until the later stages, while if it is extra-pontile they appear very early.

Associated with the auditory nerve symptoms there are usually those belonging to the vestibular apparatus. The latter may be absent, however, even when the cochlear nerve is injured. Of particular importance are the morbid manifestations of the trigeminus nerve. These are observed very early. The sensory part of the nerve is injured very much more frequently than the motor part. It is not yet definitely known whether the failure of corneal reflexes is always the first symptom of an injury

to the trigeminus nerve (Oppenheim). Symptoms due to the facial nerve are frequently absent from the disease picture.

Disturbances of the muscles of the eye are often observed. These are mostly remote effects of an increase in the intracerebral pressure. Pronounced cerebellar symptoms may be entirely absent in spite of extensive destruction. According to Barany, nystagmus is an associated symptom caused by pressure on Deiters' nucleus. Disturbances of the motor and sensory tracks of the extremities and trunk are caused by pressure on the pons. It is astonishing what slight symptoms may be caused by even visible injuries to the pons and medulla oblongata. According to whether the pressure affects the pyramidal or sensory tracks on the same or the opposite side, there is hemiparesis of the one or other side. The sensory tracks are generally involved later and less frequently than the motor.

There are no positive symptoms making possible a differential diagnosis between tumors of the cerebellopontile angle and tumors in the pons and cerebellum. The origin of the symptoms must be considered and, above all, the order in which they appeared. Thus it may be regarded as certain that in cases of tumor of the cerebellopontile angle the lower cranial nerves are damaged first, especially the auditory nerve, and cerebellar and pontile disturbances do not develop until later. It is entirely different in cases of simple cerebellar tumor. In these, the cerebellar symptoms always are noted first and the paralysis of the lower cranial nerves does not develop until later.

In intrapontile processes the disease picture is usually introduced by manifestations of sensory and motor irritability. The paralysis of the cranial nerves which develops subsequently is more often bilateral than unilateral. Disturbances of hearing are not so early observed when the tumor is intrapontile, but when they are present they are usually more severe than in cases of tumor of the pontile angle since in the latter the auditory nerve on the uninvolved side usually remains unaffected and conceals the loss of function on the involved side. Encroachment of the growth upon the vestibular nucleus and cerebellum causes disturbances in equilibrium and gait. Choked disc is usually absent.

WERDE (Z).

Smith, S. M.: Postoperative Treatment of Brain Abscess. *Ann. Otol., Rhinol. & Laryngol.*, 1921, xxx, 970.

At the time of the first packing, great care must be exercised to manipulate the brain substance gently and just as little as possible. When a drainage tube is used and allowed to protrude, considerable damage may be done by applying a flat dressing over it. It is much better to place a quantity of loose gauze packing at the outer end of the drain.

The cigarette drain, which is preferred by the author, must be carefully inserted to the full depth of the abscess cavity. If iodoform gauze is employed

—and this is advisable in almost all primary dressings—it must be borne in mind that its continued use over an extended period may cause symptoms of iodoform poisoning.

The author has rarely used irrigation in cases of brain abscess.

In cases of imperfect drainage, finger exploration has proved of value. Smith believes that the principle of the Mosher and the British Army drain is good but states that he has not used these drains.

The dressings should be changed once, or, if necessary, twice a day.

The encapsulated form of abscess requires a longer period to heal by the development of granulations than the unencapsulated type, and must therefore be drained for a longer time.

The dura should not be sutured. The usual methods of protecting the dura before and during operation should be scrupulously carried out afterward until the abscess has entirely healed and the wound is closed.

H. A. MCKNIGHT, M.D.

Trotter, B. C.: A Case of Lateral Sinus Thrombosis.
Lancet, 1922, ccii, 128.

The article describes an interesting case of lateral sinus thrombosis probably due to acute pyorrhœa and alveolar abscess.

The patient was a healthy farm laborer who, after working in the hot sun, developed headache, dizziness, and a tender swelling in front of the right ear. All of his teeth were more or less decayed, and the gums swollen, red, and purulent. Two days later, after chills, high fever, sweating, and otorrhœa, a diagnosis of acute otitis media with lateral sinus thrombosis was made.

Two days later he was operated upon. The internal jugular vein, which was found to be empty, was ligated through an incision over the anterior border of the sternocleidomastoid muscle, and the incision closed except for the lower $\frac{1}{2}$ in. The mastoid was then opened, but no pus was found. When the incision was deepened down to the lateral sinus a quantity of foul, blackish liquid pus was evacuated. The opening into the lateral sinus was enlarged to admit the end of the little finger and the cavity washed out with hydrogen peroxide. A drainage tube was then inserted and the wound lightly packed with sterile gauze.

After severe headache and fever for about two weeks the patient recovered. Vomiting was pernicious and was stopped only by $\frac{1}{2}$ oz. doses of champagne every hour for several hours.

A foul nasopharyngeal discharge on the fourteenth day which interfered with deglutition was cleared up after a week by a nasal douche and gargle of a mild alkaline solution.

On the fifteenth day headache was persistent, but was relieved by needle puncture of the posterior fossa and the removal of turbid fluid. The next day incision and drainage over this spot marked the turning point in the patient's condition. On the sixteenth day the teeth were removed. Recovery

was rapid, with complete healing on the thirty-first day.

The infection probably began in the teeth and from there progressed to the lateral sinus through the pharyngeal veins, parotid region, and internal jugular vein by ascending thrombosis.

MARCUS H. HOBART, M.D.

Frazier, C. H.: Neuralgias of the Trigeminal Tract and Facial Neuralgias of Other Origin: Impressions Derived from a Survey of 555 Cases.
Ann. Otol., Rhinol. & Laryngol., 1921, xxx, 855.

Major trigeminal neuralgia begins without any apparent exciting cause and usually after middle life with a sharp, shooting, stabbing, lancinating pain in one of the three divisions of the trigeminal nerve, usually the second or third. The pain is likened by the patient to an electric shock or the pain that would be caused by a boring hot iron or the tearing of flesh. Its distribution has definite anatomical limitations, and without variation it is referred to the terminal distribution of the nerve involved, to the lips, gums, tongue, teeth, nose, or forehead.

The pain is not controlled by morphine. The habitual use of morphine is presumptive evidence that the patient is not a subject of major trigeminal neuralgia.

The neuralgias due to tumor invasion may be confused with the major trigeminal neuralgias. If the tumor involves a root or ganglion, the pain is often paroxysmal and in other respects its resemblance to major trigeminal neuralgia is quite striking. There are, however, points of distinction which, if not overlooked, are sufficient for purposes of differentiation. Chief among these are objective sensory disturbances, hyperæsthesia or anæsthesia in some portion of the trigeminal distribution.

Frazier doubts that sinus and dental infections are causal factors of major trigeminal neuralgia. The true cause is still unknown.

If vascular changes, arteriosclerosis, fibrosis, and a secondary anæmia are causative agents, the disease would not be so conspicuously a unilateral affection.

In certain neuralgias cocaineization of the sphenopalatine ganglion controls the pain almost immediately but Frazier is at loss to explain the significance of this unless the sympathetic system is a factor. Certainly treatment directed to the trigeminal tract is of no avail.

Frazier summarizes his observations regarding the types of neuralgia as follows:

"We recognize, first of all, a definite clinical entity in what we prefer to call 'major trigeminal neuralgia,' the symptoms of which are so characteristic that a diagnosis can be made that should admit of no discussion. The etiology is still a matter of speculation. We recognize other neuralgias in the distribution of the trigeminal nerve, some of them simulating the major type, such as the neuralgias due to tumors involving the sensory root, the

ganglion or its several divisions, or the neuralgia following herpes zoster. We recognize a third group of neuralgias involving chiefly the ophthalmic division, that we believe to be of toxic origin; symptomatically they have nothing in common with the major type. We recognize a fourth or miscellaneous group in which the pain, though of great intensity but not paroxysmal, is referred chiefly to the orbit, temple, and cheek, sometimes to the neck, and is associated frequently with general headache or hemicrania, a group in which our suspicion has been aroused as to the part the sympathetic system may play in its origin. We recognize, finally, a fifth group, which we classify with the psychoneuroses or psychalgias."

In cases of major trigeminal neuralgia Frazier has done 204 avulsions or sections of the sensory root, five complete excisions of the ganglion, and five partial excisions of the ganglion. There has been but one operative fatality in the last 177 cases. The operative technique is described.

Complications which may follow the operation are: anæsthesia of the area supplied by the nerve operated upon; deterioration of hearing on the side operated upon; trophic lesions in the cornea, which are easily controlled by proper early treatment; and transitory facial paralysis. In the last 121 cases, in which the self-retaining retractor was not used, transitory facial paralysis did not develop.

If a clear case is made out for neuralgia of the sphenopalatine-ganglion type, permanent relief will come only when the ganglion is excised. The part which the sphenopalatine ganglion plays in the etiology of these atypical forms cannot be definitely determined until the ganglion itself has been excised in a series of properly selected cases. In this problem and in the investigation of the rôle of the sympathetic system lies the most fertile field for future research.

Six cases are reported to illustrate the various types of neuralgia. CARL R. STEINKE, M.D.

Krueger, R.: The Surgical Treatment of Prognathism (Die chirurgische Behandlung der Prognathie). *Arch. f. klin. Chir.*, 1921, cxviii, 261.

Prognathism is characterized by protrusion of the chin, a high lower jaw, a thickened lower lip, and imperfect closure of the teeth. It usually results in enlargement of the tongue, disturbances of nutrition, and interference with speech. It may be congenital or acquired as the result of a fracture, luxation, or joint disease. In the first type, the true prognathism, the initial symptoms appear about the sixth year of life and end at the time of puberty as complete prognathism. In the beginning, dental-orthopedic measures may be considered, but after the end of the bony development of the mandible results can be obtained only by surgical-dental treatment.

Various measures have been proposed. In the choice of a method, the deciding factor under all circumstances must be the anatomical character

of the particular case. Up to the present time the literature contains the reports of: (1) wedge or trapezoid resections from the horizontal ramus of the lower jaw, (2) the same resections from the angle of the jaw, (3) the sawing-through of the ascending ramus with displacement of the fragments, (4) the arched sawing-through of the angle of the jaw, and (5) resections of both condyles.

After a short critical review of these various procedures and a consideration of the alleged disadvantages associated with bilateral resection at the horizontal ramus, the author describes the treatment used by Schroeder, Ernst and himself in three cases. The first part of the technique consisted in the preparation of the mouth, the creation of gaps between the teeth, the formation of the plaster models for the preparation of the splint apparatus and resection to allow a normal bite, and the mounting of the splints on the teeth. Then, under local and conduction anæsthesia, a small incision was made parallel with and below the border of the lower jaw, the bone was exposed subperiosteally in the tooth space without opening the oral cavity, an angular division of the mandible was effected by means of closely-placed bored holes of small caliber and division of the intervening trabecula of bone with a chisel, the maxillary fragments were approximated, the intra-oral wires were screwed tight, and the wound was closed with suture of the periosteum and skin. A fluid diet was given during the first few days. Bone sutures were avoided. Consolidation occurred in two or three months and the cosmetic and functional results were excellent.

HEINEMANN-GRUEDER (Z).

NECK

Bloch, J. C., and Charrier, J.: Notes on the Surgical Treatment of Goiter (Notes sur le traitement chirurgical des goitres). *Presse méd.*, Par., 1921, xxix, 853.

The authors state that during a recent trip to Berne they had occasion to see a number of operations for goiter, "an affliction so frequent in Switzerland that there is not a surgical session at which one or several goiter operations are not performed." As the therapeutic methods used in Switzerland differ greatly from those used in France, the authors believed it would be of interest to describe them in detail.

The indications for operation vary according to whether the condition is simple or exophthalmic goiter.

In France the nodular and cystic goiters predominate and the usual operative procedure is an enucleation without previous ligature. In Switzerland, on the contrary, the incidence of parenchymatous goiters is about 10 per cent, not including the goiters called "goitres du soldat" which are common between the ages of 20 and 25 years and are both parenchymatous and nodular. In such cases enucleation is impossible.

In cases of parenchymatous goiter the Swiss surgeons ligate the thyroid arteries and then do a resection. They ligate the two inferior arteries first and after delivery of the goiter tie off the trunk of one superior thyroid artery or the anterior branches of both of them. The goiter is resected by means of a partial thyroidectomy, the isthmus, the posterior portion of the two lateral lobes in the region of the recurrent nerves, and the parathyroids being left.

In cases of nodular and cystic goiters, even if enucleation is possible, the first step in the operation is ligation of the inferior thyroid artery. If the goiter is unilateral, the two thyroid arteries on one side are ligated. When there are nodules in both lobes, the technique employed for parenchymatous goiters is used. As soon as the ligations have been made, a strumectomy is performed. Sometimes, but only when there is a single cyst or an isolated lump, subcapsular enucleation is done.

The authors state that in their astonishment at seeing the Swiss surgeons employ such a complex and difficult technique, they asked the reason why resection was preferred to enucleation. All the operators replied that the conservation of a large portion of the thyroid gland favors recurrence and that the ligatures, besides preventing hemorrhages during the resection, have the further advantage that they produce a partial anemia of the gland.

For the treatment of Basedow's disease the Swiss surgeons, de Quervain in particular, advocate operation. In general, de Quervain prefers thyroidectomy, or at least partial thyroidectomy, to ligation alone. The latter is used only when the patient's condition will not permit a more radical procedure. The operation is indicated or contra-indicated entirely by the patient's clinical condition. Swiss surgeons do not seem to attach as much importance to the metabolism as American surgeons. De Quervain, in particular, emphasizes the fact that the surest guide to the proper type of operation is clinical experience gained by the study of many cases. He believes that medical treatment is inefficacious and indicated only when the condition is so severe that operation is contra-indicated. In such cases rest in bed and the administration of bromides make it possible to delay operation until the condition has improved. A partial thyroidectomy or at least a hemithyroidectomy is then performed. If this is impossible, an inferior artery on one side or the two thyroid arteries are ligated. Only one side is done at a time as in this way the opposite side is kept free from cicatricial adhesions so that if a second operation is required it can be performed easily. The ideal technique consists of a first-stage operation in which one lobe is removed after ligation of the two thyroid arteries on the same side and, if necessary, a second-stage operation in which the greater part of the other lobe is removed after ligation of the corresponding inferior artery.

The authors describe the regional anatomy with special reference to the descriptions of de Quervain and Cunéo and in a schematic drawing show the

routes of access to the inferior thyroid artery and the gland.

In the rest of the article the operative technique employed by the Swiss surgeons is described in detail. Regional anæsthesia induced by means of a 1:200 solution of novocaine is practically always employed. The incision is made in accordance with the technique of Kocher. The various steps in the ligation of the inferior thyroid arteries, the delivery of the goiter, the ligation of the superior thyroid arteries, the resection of the goiter, and the closure of the wound are described.

In conclusion the authors state that in their opinion all the indications for the surgical treatment of goiter in France are met by subcapsular enucleation.

W. O. JOHNSON, M.D.

Crile, G. W., and Lower, W. E.: Special Points in the Technique of Operations on the Thyroid Gland. *Ann. Surg.*, 1922, lxxv, 47.

On the basis of their experience the authors emphasize the following points in the operative technique:

1. In general the functional equivalent of a normal gland should be left. This means a small piece of an exophthalmic gland and a large amount of a colloid goiter.

2. Resecting only the larger lobe has a poor cosmetic effect. Removing both lobes and leaving the poles, which will appear as lumps, is not entirely satisfactory. If the median lobe is left, it suggests an Adam's apple.

3. A long vertical median incision is used only for midline adenomata or small goiters. High division of the muscles does not permit adequate dissection of the lower pole. When more than a vertical incision is necessary, transverse division is employed.

4. Tying the four arteries outside of the capsule may result in parathyroid deficiency due to the decrease in the blood supply.

5. Catching masses of thyroid tissue by large forceps and ligating *en masse* may interfere with the voice and has been abandoned. Individual vessels should be clamped with small forceps.

6. Pushing out a bilateral burrowing goiter by traction, pressure, and stretching may damage the recurrent nerves, cause immediate bilateral paralysis of the vocal cords, interfere with the air intake, and necessitate tracheotomy. Bronchopneumonia and death may result. A large vein may be torn and complicate the operative field. Primary separation of the upper attachment of the lobe and a slight pull from above permits the thyroid to rise out.

7. Catching and tying bleeding vessels on the surface of the trachea necessitates the inclusion of the peritracheal fascia and sensory nerves which enter the trachea. This may cause irritation, coughing, and increased mucus with possible resultant local tracheitis, bronchitis, bronchopneumonia, and death. This is avoided by bloodless dissection above

the line of cleavage so that vessels may be ligated without including the sensory nerves.

8. Interference with the mechanism of swallowing may result from: (1) dislodging with the finger a gland that has extended between the larynx and œsophagus and pharynx; (2) attempting to catch an escaped superior or inferior artery; (3) dissecting between the œsophagus and larynx.

9. A collapsed trachea may be dilated by means of the gas-oxygen apparatus. For tracheotomy, a small transverse opening between the rings should be made early rather than late.

10. The operative field must be kept clear.

11. Blood in the trachea may initiate bronchopneumonia.

12. In serious cases the wound is left completely open and dressed with gauze soaked in a 1:5,000 solution of flavine. The advantages are: (1) a decrease in the time of the operation; (2) the absence of postoperative pain and discomfort; (3) the prevention of absorption of aseptic wound secretion. Wounds are closed under analgesia and local anæsthesia, with the patient in bed, usually on the afternoon of the same day or the next morning, but occasionally on the second day. After the first six hours there is a slight tendency to increased contamination.

13. The operation is stopped at any point when there is doubt as to the outcome; and may be resumed and completed on the following day.

14. If patients demand to know the time of operation they are told, but otherwise preparations are carried on so carefully that they will not know the place or time.

15. Although the X-ray reduces the activity of the thyroid, it has the following disadvantages: (1) the dose required to produce a given effect is guessed at: if it is sufficient to kill all thyroid cells, myxœdema results; if it does not kill the cells, relapse occurs; (2) relapses are common; (3) delay in unsuccessful cases leads to serious damage to the myocardium, liver, nervous system, etc.; and (4) scar tissue and adhesions caused by the X-ray complicate the operation.

16. Ligation is employed as a preliminary to thyroidectomy. Double ligation rarely cures and may be followed by a relapse.

17. The beneficial effect of ligation is due probably, not to the decrease in the blood supply, but to the break in the sympathetic nerves which lie on the walls of the superior thyroid arteries.

18. A diagnosis of hyperthyroidism is an indication for thyroidectomy. If rest fails to cure, the patient sustains serious damage to the myocardium, liver, and nervous system, and the difficulty of operation is increased.

On the basis of operability the authors class hyperthyroidism with appendicitis. The mortality of thyroidectomy is almost as low as that of appendicitis.

1922, iii, 39

WALTER C. BURKET, M.D.

breast,

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Hedblom, C. A.: *The Diagnosis and Treatment of Tuberculous Empyema*. *J. Lancet*, 1921, n.s. xli, 644.

The author discusses the etiology, pathology, bacteriology, diagnosis, and treatment of tuberculous empyema. The end-results are known in sixty-seven of seventy-four cases treated at the Mayo Clinic since 1910. Fifty-eight and two-tenths per cent of the patients are cured or much improved; nearly 4.5 per cent are not improved; 37.3 per cent are dead; and 14.9 per cent died within two months of the operation.

In a summary the author formulates tentative conclusions as follows:

In a large number of cases primary or idiopathic pleurisy with effusion is probably tuberculous in nature.

Tuberculous pleurisy may be primary or it may be secondary to a pulmonary, peritoneal, or other tuberculous lesion.

The onset of tuberculous effusion may be insidious or sudden, and may be associated with an acute and severe constitutional reaction.

A mixed infection due to the perforation of a tuberculous cavitation often runs an acute and rapidly fatal course.

The diagnosis of tuberculous empyema is made by the demonstration of the bacilli in the exudate, by animal inoculation, or by examination of the sectioned pleura.

A sterile effusion is probably tuberculous; an infected effusion may be tuberculous.

An empyema may be tuberculous in spite of persistently negative findings over a long period of time.

Empyema following primary idiopathic pleurisy with effusion, and empyema of insidious onset, especially when associated with a pulmonary or other tuberculous condition, is probably tuberculous.

Repeated aspiration of only a part of the fluid is indicated in cases of serous effusion producing definite dyspnoea on exertion or symptoms of circulatory embarrassment.

The replacing of aspirated fluid by nitrogen or filtered air may be indicated in cases with symptoms of active phthisis referable to the same side as the effusion.

A sterile purulent effusion should be treated as though it were serous if the lung expands when the fluid is withdrawn. If the lung is fixed in a collapsed condition or if the purulent effusion persistently recurs, a plastic operation may be indicated.

An infected purulent effusion should be treated by the closed method with antiseptic irrigations or by open drainage; open drainage is indicated especially

in cases of severe infection associated with extensive pulmonary tuberculosis.

A plastic operation involving closure of a bronchus offers the only prospect of cure in a case with an associated large bronchial fistula.

Dakin's solution may be contra-indicated in the presence of an extensively diseased lung because of its corroding action on superficial lesions resulting possibly in hæmorrhage or the formation of a bronchial fistula.

An extrapleural rib resection is indicated for the collapse of closed sterile empyema cavities. The Bouffin-Wilms operation (Friedrich) is especially suitable for the collapse of large cavities without excessive thickening of the parietal pleura or rib deformity.

A skin or muscle plastic operation is indicated for the obliteration of relatively small draining cavities.

Cases of long standing in which the pleuræ are greatly thickened may require extensive resection of the entire chest wall after the method of Schede.

Operation in several stages is indicated especially in the treatment of tuberculous empyema. Such treatment should extend the indications for operation and lower the postoperative mortality.

L. H. FOWLER, M.D.

Shortle, A. G., and Gekler, W. A.: A Report of Four Recent Cases of Thoracoplasty. *J. Am. M. Ass.*, 1922, lxxviii, 168.

The failure of the earlier operation, hydrothorax, of the lungs was due to: (1) the shock caused by lengthy operations and the loss of blood, and (2) disturbance of the respiratory rate, mediastinal flutter, and often death caused by the removal of one side of the chest wall.

It has been found that in 25 per cent of cases artificial pneumothorax is unsuccessful because of pleuritic adhesions. Instead of the Friedrich operation, the authors have adopted the safer operation of Sauerbruch, in which ribs from the first to the ninth are resected, usually at one sitting, and gas-oxygen is used instead of ether.

In this article the following cases are reported:

CASE 1. The patient was a woman, 45 years of age, who had had pleurisy with effusion in 1910. In 1918, cough and partial loss of voice developed. The sputum contained tubercle bacilli. The afternoon temperature was 99.5 degrees F. Artificial pneumothorax in April, 1919, was unsuccessful. All the symptoms became progressively worse. In May, 1920, an operation was performed. The fever subsided after the first week. Recovery was gradual and complete and associated with a gain of 20 lbs.

CASE 2. The patient was a man, aged 32 years, who developed cough and a rise in temperature with some hoarseness in December, 1917. Symptoms of pulmonary and laryngeal tuberculosis were present with "flare-ups" in the temperature. Following operation in May, 1920, the temperature remained elevated and the sputum profuse for six

to eight weeks, but then slowly decreased to normal. The patient is well at the present time and his weight is normal.

CASE 3. This patient was a woman aged 30 years. Active tuberculosis from the apex to the base of the left lung was diagnosed in 1918. The lung was collapsed and the symptoms disappeared. In June, 1920, the patient returned with a relapse. As it was impossible to collapse the lung again, thoracoplasty was performed. At the end of nine weeks the patient died from cardiac incompetency.

CASE 4. The patient was a man aged 34 years. Examination revealed in addition to active tuberculosis with cavity formation in the left lung, weakness of the heart, a low blood pressure, and a 4 plus Wassermann reaction. Operation was performed, but the patient developed ascites and died of cardiac weakness.

The authors state that thoracoplasty should be performed only when the simpler artificial pneumothorax is found impossible. All cases should be carefully selected in regard to heart action and the condition of the opposite lung, as the operation causes sudden collapse of the affected lung and the burden is at once thrown upon the opposite side. Gas oxygen is the best anæsthetic and may be supplemented by procaine.

WILLIAM J. PICKET, M.D.

the poles which, and Duboucher, H.: Cervico-mediastinal Tumor on the Left Side Probably of Thyroglossal Origin; Extirpation After Disarticulation and Temporary Depression of the Clavicle; Operation Pneumothorax; Ligation of the Subclavian and Vertebral Vessels; Recovery (Tumeur cervico-médiastinale gauche d'origine thyro-glosse probable. Extirpation après désarticulation et abaissement temporaire de la clavicule. Pneumothorax opératoire; ligature de la sous-clavière et de la vertébrale. Guérison). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 1135.

In the case described operation was decided upon because of incessant vomiting and progressive weakness. The condition was diagnosed as a subclavian tumor of unknown nature which compressed the pneumogastric nerve and by this irritation caused complete gastric intolerance. The clavicle was dis-inserted, the pneumogastric nerve, which was stretched over the anterior surface of the tumor, was disengaged, and the jugular vein was ligated and sectioned. The tumor was found to involve the subclavian artery and the innominate trunk and was isolated with difficulty; the subclavian artery was torn and ligated. The apex of the lung had been completely destroyed but the operative pneumothorax did not cause complications. At the end of the operation the patient was in a very poor condition but ultimately made a good recovery. Histologic examination of the removed tumor suggested a thyroglossal origin.

Duval, in submitting and discussing this report, stated that in order to approach the subclavian fossa, the lower carotid region, and the lateral

region of the anterior mediastinum in cervico-thoracic surgery it is necessary to supplement the exposure of the subclavian fossa by an incision above the sternocleidomastoid. The extent of the resection of bone will vary according to the necessity for a greater or less descent into the mediastinum. With regard to the harmlessness of the surgical pneumothorax in the case reported he cited a similar favorable outcome following accidental operative pneumothorax reported from the Mayo Clinic by Hedblom. Duval believes that when severe complications follow an accidental operative pneumothorax it is best to transform the partial pneumothorax into a total pneumothorax and immobilize the lung by totally collapsing it. W. A. BRENNAN.

Schwyzzer, A.: Notes on Surgery of the Mediastinum. *Ann. Surg.*, 1922, lxxv, 53.

In preliminary remarks the author briefly enumerates pathologic conditions of the mediastinum: inflammations and purulent infections resulting from direct trauma, such as those due to a penetrating wound or œsophageal perforation, and those due to direct extension or the breaking down of lymph glands; tuberculous glands; gummatous Hodgkin's disease; leukæmia; simple hyperplasia or neoplasms of the thymus; intrathoracic goiters; aneurisms; benign neoplasms, such as lipomata, chondromata, fibromata, and dermoids; and malignant growths, such as carcinomata, sarcomata, and lymphosarcomata.

In one case Schwyzzer approached the posterior mediastinum by resecting several ribs near the costovertebral articulation and stripping back the pleura. He reports also two cases of purulent infection in the anterior mediastinum in which the disease focus was approached by resecting several ribs anteriorly over the region of infection. A case of aneurism of the innominate trunk was cured by ligation of the common carotid and subclavian arteries near the aneurismal sac. The patient has now been well for eleven years.

Another case cited was a case of spindle-celled sarcoma of the mediastinum operated upon by Marwedel in Czerney's Clinic in 1901. The growth was successfully removed and at the time the report was made the patient had been well for two years and two months.

At present, hope lies mainly in roentgen and radium treatment of malignant neoplasms of the mediastinum. In a case of mediastinal angiosarcoma considerable relief was obtained by the use of the X-rays and 8,600 mg.-hrs. of radium.

The author reports the successful removal of a mediastinal fibroma by means of a collar incision in the neck, a vertical incision over the sternum, and partial resection of the sternum. Positive pressure was used. In the closure of the wound the thoracic cavity was made air tight by suture of the subcutaneous tissue over the sternum and of the sternohyoid, sternothyroid, and sternomastoid muscles over the suprasternal region.

The differential pressure apparatus consisted of a Ben Morgan ether chamber or a large rubber bag connected with a foot bellows. The ether chamber or rubber bag is connected also by a long rubber tube and a forked glass arrangement with two intranasal tubes which are inserted down to, but not beyond, the soft palate. The long rubber tube is broken by a T tube, one arm of which is attached by a rubber tube to a glass tube about 1 ft. long, which is inserted in a tall glass and adjusted to extend 22 or 23 cm. below the level of water in order to obtain approximately 17 mm. of mercury pressure. This latter serves as a manometer. The bellows is pumped just sufficiently to produce a gentle bubbling of the water. The anesthetist regulates the pressure by closing the patient's mouth. Ether vapor can be run into the system by a side tube attachment connected with the ether bottle and a rubber hand bulb. A tightly fitting face mask may be used instead of intranasal tubes, but is not so efficient. The narcosis is smooth.

The author agrees with Sauerbruch that local anesthesia in its present form is unsatisfactory in intrapleural operations.

WALTER C. BURKET, M.D.

Dickinson, G. K.: The Breast Physiologically and Pathologically Considered with Relation to Bleeding from the Nipple. *Am. J. Obst. & Gynec.*, 1922, iii, 31.

The breast, which is intended to functionate as a secondary sexual organ, is influenced by hormones, toxins, and the psyche. Hyperæmia is induced monthly by the ovarian secretion, and if pregnancy ensues, the hormones activate the gland to further growth, and the formation of colostrum which, if reabsorbed, determines the time of labor.

The breast requires normal function and will tend to pathologic states of the tumor type if the natural cycle is interfered with. In certain persons the suppression of the menstrual flow may produce active congestion of the breast with pain, tenderness, and sometimes bleeding. There is such a response also in certain cases of metritis, parametritis, and ovarian tumors. At the menopause there is more or less change in the breast with an increased tendency to pathologic conditions.

Before the thirty-fifth year of age the most common type of breast tumor is the fibroid. In some cases this produces bleeding from the nipple. After the thirty-fifth year the fibrous tissue grows into the breast substance, and the irritation so caused is sufficient to produce a blood-stained discharge.

The most common causes of bleeding from the nipple are papillomata, proliferations of the duct linings. In a number of cases the microscope showed that the cells at the base had begun to wander, thus demonstrating evidences of malignancy.

It is now believed by pathologists that tumor formation in the mammae is a type of chronic inflamma-

tion. Curiously, the left upper outer lobe is the part most apt to be the site of chronic interstitial change.

The wandering cell produces local inflammatory reaction, with the formation of fibrous tissue. If the glandular substance is in excess the neoplasm is a soft cancer, while if the fibrous substance is greater, the neoplasm is of the scirrhous type. These types are equally malignant.

There is no reliable sign as to malignancy or beginning malignancy. The benign condition is apt to be only temporary. We have not as yet a definite plan of attack for benign tumors; some surgeons resect in part, some do a complete plastic subcutaneous resection, and others a radical removal.

C. H. DAVIS, M.D.

Sistrunk, W. E., and MacCarty, W. C.: Life Expectancy Following Radical Amputation for Carcinoma of the Breast: A Clinical and Pathologic Study of 218 Cases. *Ann. Surg.*, 1922, lxxv, 61.

The factors which seem important in determining the expectancy of life were carefully studied from a clinical and pathologic standpoint in a series of 218 cases of carcinoma of the breast operated on in the Mayo Clinic. One of the most important questions in the whole subject of cancer is why some patients live longer than others who have grossly the same or less amounts of local or general cancer.

Of the series of 218 patients, 2.7 per cent died within six months; 21.1 per cent, within one year; 34.9 per cent, within two years; 42.2 per cent, within three years; 49.1 per cent, within four years; and 55 per cent, within five years. Only 2.3 per cent died after five years. After eight years the disease rarely recurs.

Carcinomata which developed during pregnancy or the lactating period invariably proved fatal within five years after operation. Diffuse carcinomata which involved practically the entire breast caused death in every instance within five years; all but one of the sixteen patients with this type of growth died within three years after operation. When the axillary glands were involved, carcinomata around the nipple proved fatal in seventeen of eighteen cases (94.5 per cent) within five years. Seventeen of twenty patients with ulcerating carcinomata (85 per cent) were dead at the end of seven years; fourteen died within five years after operation.

Age seems to have a definite bearing on the results to be expected following operation. Forty-one and seven-tenths per cent of the patients over 50 are alive from five to eight years after operation, while only 31.8 per cent of those under 50 have lived a corresponding length of time. The immediate hospital mortality was less than 0.5 per cent.

Of a series of 218 patients with mammary cancer operated on at the Mayo Clinic it was found that 138 are dead; the specimens of ninety-one of these patients were studied from the standpoint of cellular differentiation, lymphocytic reaction, fibrosis, and hyalinization. All pathologic specimens were

studied independently of the clinical histories. From the facts found in the study of these ninety-one cases the authors make the following generalizations on mammary cancer:

1. Cellular differentiation occurs in 15 per cent.
2. Local lymphocytic infiltration occurs in 62 per cent.
3. Local hyalinization occurs in 54 per cent.
4. Local fibrosis occurs in 71 per cent.
5. Lymphocytic infiltration and fibrosis occur in 41 per cent.
6. Lymphocytic infiltration and hyalinization occur in 28 per cent.
7. Hyalinization and fibrosis occur in 52 per cent.
8. Lymphocytic infiltration, hyalinization, and fibrosis occur in 28 per cent.
9. The average length of postoperative life of patients with lymphocytic infiltration alone is 28 per cent greater than the average length of postoperative life of the patients in this series.
10. The average length of postoperative life of patients with lymphocytic infiltration, hyalinization, and fibrosis is 15 per cent less than that of patients with local lymphocytic infiltration in this series.
11. The average length of postoperative life of patients with lymphocytic infiltration, hyalinization, and fibrosis is 37.8 per cent greater than the length of postoperative life of patients in this series.
12. The average length of postoperative life of patients without lymphocytic infiltration, hyalinization, and fibrosis is 42 per cent less than the average length of postoperative life of patients with lymphocytic infiltration, hyalinization, and fibrosis.
13. The average length of postoperative life of patients with cellular differentiation is 57 per cent greater than the average length of postoperative life of the patients in this series.
14. The average length of postoperative life of patients with fibrosis is 7 per cent greater than the general average length of postoperative life of patients in this series. It is also 42 per cent greater than that of patients without fibrosis.
15. The average length of postoperative life of patients with lymphocytic infiltration and hyalinization is 44 per cent greater than the average length of postoperative life of patients in this series.
16. The average length of postoperative life of patients with fibrosis and hyalinization is 71 per cent greater than the average length of postoperative life of patients in this series.

From these generalizations it is concluded: (1) that the three greatest single factors in increased postoperative longevity in this series of ninety-one cases of mammary cancers were cellular differentiation, hyalinization, and fibrosis; (2) that lymphocytic infiltration alone does not seem to be the main factor; and (3) that while hyalinization and fibrosis appear to play individually some part in increasing longevity in cases of cancer of the breast, the two, when present in combination, constitute the greatest known defensive factor against the invasion of tissues by cancer cells.

TRACHEA AND LUNGS

Kaempfer, L. G.: A Foreign Body in the Lungs Innocuous for Forty Years. *Am. J. Surg.*, 1922, xxxvi, 8.

Kaempfer's case was that of a widow, aged 58 years, who had been in perfect health up to a few months before her death, but then developed a cough and later symptoms and signs which led to a diagnosis of bronchitis. Her condition became worse and three weeks before death a diagnosis of lung abscess in the lower right lobe was made. An X-ray plate showed an opacity in the lower right chest and also a well-defined shadow about 3 in. long and with parallel edges $\frac{1}{4}$ in. apart in a vertical position just to the right of the bodies of the vertebræ and merging its lower margin in the less dense shadow of the lower chest. This shadow was believed to be that of a foreign body which probably was the cause of the lung abscess. However, it was very difficult to reconcile this assumption with the fact that a foreign body of such size could not have been inhaled by an adult unconsciously, that such a foreign body would first lodge in one of the larger bronchi and thus lie in the direction of the bronchus rather than in a vertical position, and that repeated bronchoscopic examinations had not revealed it. A thoracotomy was decided upon, but the patient suddenly went into collapse and died.

At autopsy a large empyema cavity containing several hundred cubic centimeters of pus was found. Almost the entire right lower lobe was gangrenous. In a cavity entirely separated by healthy lung tissue from both the gangrenous portion of the lung and the empyema cavity and apparently completely walled off was a slate pencil about 3 in. in length and $\frac{1}{8}$ in. in width. The pencil cavity was separated from the mediastinum by lung tissue.

No scars were found in the œsophagus. From the appearance of the scar tissue around the pencil and the fact that the patient could not remember having aspirated any large foreign body, the author concludes that the pencil must have been there for a very long time, probably since childhood. It apparently had no etiological bearing on the lung abscess.

RALPH B. BETTMAN, M.D.

Hug, O.: Thoracoplasty and Scoliosis (Thorakoplastik und Skoliose). Stuttgart: Enke, 1921.

In the first part of this monograph the author discusses the development and the present views regarding the surgery of pulmonary tuberculosis. After a short historical summary of the development of thoracic surgery he discusses the usual methods of operation: rib resection, pneumothorax, pneumolysis, pulmonary plugging, phrenicotomy, and thoracoplasty. The operation for old empyema fistulæ is also considered in detail.

The second part of the work deals with the phenomena in the thorax and spinal column following operations for pulmonary diseases. In this con-

nection the severity of the operation, the patient's age, and the pliability of the bones are of importance. In every markedly developed case of pulmonary tuberculosis the concavity of the arch of the vertebral column is toward the disease focus if curvature of the spine develops at all. When pneumothorax treatment is given there is no curvature of the spine; in fact, this treatment may overcome a deformity.

If a unilateral thoracic operation or phrenicotomy is done on a patient who is still growing, the more rapid and stronger growth of the normal side is a factor in the developing deformity. In every case the flattening and contraction of the thorax precedes the curvature of the spine. Efforts must therefore be directed toward preventing thoracic contraction. In extensive rib resections the muscular traction of the normal side is opposed only by the cicatricial complex of the collapsed and shrinking lung. This traction is not equal and the lung cannot be placed at rest. Of all the patients with severe scoliosis who were examined subsequently by the author not one was clinically well.

Hug examined twenty-two patients who had been operated upon by Sauerbruch or Schreiber. The histories of these cases are given in detail. In forming an opinion of the results of operation the following facts must be taken into consideration: the duration of the disease previous to the operation, the kind of treatment given up to the time of the operation, the patient's age at the time of the first operation, the nature of the operation, the length of time that has elapsed since the operation, the postoperative treatment, the orthopedic measures and pulmonary findings at the time of the subsequent examination, the patient's ability to work, the condition of the thorax and respiratory musculature respectively, the direct changes in the thoracic wall, and the displacement of the shoulder girdle. In this connection the author gives a very detailed and interesting exposition of the development, morphology, and action of the trunk musculature.

The third portion of the monograph treats of the biological bases of scoliosis in general. In addition to the scoliosis following thoracoplasty, which involves chiefly the cervical spine and the adjacent upper dorsal segment, the rachitic and the habit scoliosis are discussed. The site of the former is the lumbar portion of the spine and the adjacent dorsal vertebræ. Habit scoliosis is characterized principally by dorsal deflection. Several factors come into consideration in regard to its etiology, viz., upright locomotion and right-handedness, and later the change of habits beginning with school life. Proper training, limitation of the school hours especially in the beginning, and sufficient bodily activity during the whole period of growth constitute the most necessary measures for its prevention. Rachitic scoliosis is to be prevented by preventing the basic disease. Congenital scoliosis almost always depends upon vertebral and costal anomalies.

This very readable monograph, to which an extensive bibliography is appended, will be of

interest not only to the orthopedist and surgeon but also to the lung specialist, the hygienist, and the pediatrician.

VON TAPPEINER (Z).

MISCELLANEOUS

Yamanoi, S.: Lipoma of the Thymus (Zur Lehre der Thymuslipome). *Zentrabl. f. Chir.*, 1921, xlviii, 785.

This is the second case in the literature up to the present time. Lange reported the first one. Both were discovered at autopsy. The author's case was as follows:

The patient, a woman aged 42 years, died of uræmia. The pathologic diagnosis was secondary contracted kidney, excentric hypertrophy of the heart, general arteriosclerosis, chronic œdema of the lungs, and congestion of the abdominal viscera. Just beneath the jugular incisura of the sternum was a tumor consisting of two lobes which extended bilaterally close to and behind the pericardium. Its surface was smooth in many places, but in others it was distinctly and coarsely lobulated and light yellow. Particularly in its lower parts the tumor showed a connective-tissue covering, and here the lobulated structure was effaced. The right lobe of the tumor was 18 cm. long, 9 cm. broad, and 2 to 3 cm. thick. The anterior surface of the left upper and lower lobes of the lung was slightly adherent to the growth by fibrous adhesions.

Section showed the tumor to be distinctly lobulated and of the color, transparency, and consistency of fat tissue. On microscopic examination it was found to consist almost entirely of lobulated fatty tissue with large, round fat cells. The lobules were separated from one another by small connective-tissue septa containing blood vessels. In the middle of the lobules throughout the whole tumor were found small foci rich in large round to polyhedral cells with light nuclei poor in chromatin, some of which were arranged irregularly

and others forming typical Hassall corpuscles. Adjacent to them were small thymus elements resembling lymphocytes.

To determine whether this was a case of further development and fatty substitution of a thymus which was originally too large or the blastomatous downward growth of the fatty tissue of an originally normal thymus, the author conducted investigations on thirty-three corpses ranging in age from 21 to 88 years. In only two of these thirty-three corpses, which were richly supplied with fatty deposits, was he able to find cells in the midst of fatty tissue in the mediastinal space which, even with great uncertainty, could be considered as possible thymus elements. In eleven cases he found microscopically small lymphoid foci here and there in the fatty tissue, some of which on close examination proved to be small lymph nodes and others small inflammatory infiltrations of lymphocytes.

This almost negative finding does not favor the assumption that a lipoma of the thymus arises only when the thymus was originally hypoplastic. The very great rarity of these lipomata also speaks against this theory. We must therefore assume as more probable that in these cases of lipoma of the thymus the fatty tissue begins to proliferate in an entirely normal thymus from causes unknown to us and is then drawn down into the deeper parts of the mediastinum with the remaining thymus elements.

Lange called attention also to the simultaneously existing polysarcia in his case and quoted Virchow as stating that polysarcia bears the same relation to lipomata as elephantiasis bears to fibromata. In the author's case the polysarcia was less pronounced but it was stated in the protocol that in the body, which was 162 cm. long and weighed 55 gm., a layer of light yellow fatty tissue 3 cm. thick was discovered in the abdominal skin.

VON LOBMAYER (Z).

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

La Roque, G. P.: The Intra-Abdominal Operation for Femoral Hernia. *Ann. Surg.*, 1922, lxxv, 110.

The author makes his incision through the skin, superficial fascia, and aponeurosis just above the internal inguinal ring. The fibers of the internal oblique and transversalis muscles and fascia are separated in the usual muscle-splitting fashion to expose the peritoneum. The peritoneum is then picked up and opened in the usual way. After retraction of the edges of the wound the neck of the hernia is adequately exposed from within the general peritoneal cavity. Adherent omentum and bowel can then be completely and easily separated and this region of the abdomen thoroughly explored.

With the finger or a pair of blunt curved forceps inserted in the hernial sac from above, enucleation

is effected with the aid of a gauze-covered finger externally or sharp dissection is done, the femoral and other large vessels being quite safe from injury. After the sac is freed it is turned inside out into the peritoneal cavity. The sac and redundant peritoneum in the region are pulled well upward, clamped sufficiently high to take up all the redundant peritoneum, and excised. In this way the entire sac and from 1 to 2 in. of the surrounding proximal peritoneum are removed. The cut edges of the peritoneum are then sutured.

The author has found it advantageous to tack the sutured portion to the position of the internal inguinal ring and to the edges of the original incision in the peritoneum. This, he believes, effects practically a transplantation of the peritoneum away from the region of the femoral orifice and brings the raw surface of sutured peritoneum

out of contact with the bowel and omentum. The split muscles are then loosely sutured and in a hernia of small size this is perhaps all that is necessary. When the hernia is large the under surface of the aponeurosis is caught with sutures placed very loosely as if to close the inguinal canal. La Roque cautions against tying the sutures tightly. The femoral canal or orifice he leaves open. Of twelve cases of femoral hernia treated in this manner none has recurred. The first one was operated upon over five years ago.

E. C. ROBITSHEK, M.D.

GASTRO-INTESTINAL TRACT

Reynolds, L., and McClure, C. W.: Motor Phenomena Occurring in Normal Stomachs, in the Presence of Peptic Ulcer and Its Pain, As Observed Fluoroscopically. *Arch. Int. Med.*, 1922, xxix, 1.

The authors report on fluoroscopic observations of the stomachs of normal men and of persons with ulcer of the stomach or duodenum. The purpose of the study of the cases of ulcer was to obtain detailed information regarding gastric motor phenomena occurring throughout the period in which the stomach was emptying itself and during the occurrence of pain due to the presence of the ulcer; also to establish an objective method for determining the effect of therapeutic measures. The normal persons were studied to obtain further data as to normal motor activity.

All subjects were fed one type of meal. There were five normal subjects and sixteen patients with peptic ulcer. Fluoroscopic observations on the normal human stomach after the ingestion of finely divided meat mixed with barium showed that it emptied itself in a regularly progressive manner. Peristaltic waves began high up in the gastric walls at uniform intervals of about twenty seconds and gradually deepened their progress in an orderly manner to the region of the pyloric sphincter. As each wave approached the sphincter the latter opened, allowing the ejection of chyme into the duodenum for a period of about ten seconds. The subject being in the reclining position, one of the normal stomachs emptied itself in five hours. Three of the normal stomachs were almost empty in five hours. Under the conditions of the observations here reported a very small residue remained along the greater curvature of these stomachs for a longer period. The stomach of the fifth subject contained a moderate amount of residue at the end of seven hours.

Abnormal phenomena observed in the stomachs of patients with duodenal or gastric ulcer were modifications of the motor activities of the stomachs of normal persons. The abnormalities noted were: (1) an exaggerated type of normal gastric peristalsis; (2) irregularity in the time of occurrence, the depth, and the length of the course of peristaltic waves; (3) partial or complete intermittent spasm of the pyloric sphincter; (4) a localized, permanent,

stationary spasm of the gastric musculature causing the so-called incisura; (5) gastric antiperistalsis; (6) delayed emptying time; and (7) very rapid emptying. With two exceptions, the onset of pain was accompanied by modifications in whatever type of motor activities the stomach had manifested previously. The various abnormal motor phenomena were observed in the stomachs of peptic ulcer patients who did not develop pain during the period of observation.

This discussion shows therefore that no motor phenomena are peculiar to the occurrence of the pain of peptic ulcer; that at present no accurate means is available for measuring the degree of spasm of the gastric or sphincteric musculature; and that there is almost no support for the distention theory proposed by Hurst.

In view of these facts there is no incontrovertible proof that the pain of peptic ulcer is the result of motor disturbances in the stomach and pyloric sphincter. The most satisfactory evidence in support of the theory that such motor disturbances are the cause of the pain of peptic ulcer is that the observations showed that gastric or sphincteric motor disturbances are almost invariably associated with the pain. But these observations do not furnish conclusive proof of the truth of this theory, and for this reason it must be admitted that the causal relation of motor phenomena to the pain of peptic ulcer remains problematical.

From the clinical standpoint the most important feature of the work here presented is the fact that the usual disappearance of abnormal motor phenomena occurring simultaneously with the cessation of pain gives an objective means of judging the effects of therapeutic measures.

GEORGE E. BEILBY, M.D.

De Quervain, F.: A Consideration of the Relative Merits of Resection and Gastro-Enterostomy in the Treatment of Gastric and Duodenal Ulcer. *Surg., Gynec. & Obst.*, 1922, xxxiv, 1.

The author studied the results of resection and gastro-enterostomy in 247 cases of gastric and duodenal ulcers, his purpose being to obtain aid in the solving of diagnostic problems, the determination of the general indications for operation, and the decision as to the best technique in a given case.

Operation is indicated when stenosis or repeated bleeding endangers life and when medical treatment has been unsuccessful. These limitations are mentioned because: (1) many ulcers heal spontaneously or with medical treatment, (2) in some cases, even after operation, the tendency to form ulcers remains, (3) operation does not always effect a cure, and (4) operation is accompanied by a certain risk and by certain sequelæ, such as jejunal ulcer.

Seventy per cent of the patients coming to the surgeon have had gastric disturbances for from five to thirty years, and a large proportion has been given systematic non-surgical treatment without improvement.

The rôle of hydrochloric acid in the diagnosis has been over-emphasized as the number of cases of ulcer showing normal or subnormal acidity far exceeds the number with hyperacidity. Hyperacidity was present in two-fifths of the cases of gastric ulcer and in one-third of the cases of duodenal ulcer. When other findings point to malignancy the presence of hyperacidity must not be regarded as a sign indicating the absence of carcinoma. Lactic acid was not discovered in any case of ulcer which was found to be benign at operation. This test, when positive, is of far more importance than the hydrochloric acid test. Occult blood in the stools was found in only 50 per cent of the cases of gastric ulcer and in 65 per cent of the cases of duodenal ulcer. It is seldom absent in cases of gastric carcinoma.

The author has found that the exact localization of gastric ulcer is possible by roentgen examination in 87 per cent of cases and impossible in 13 per cent. Of 100 cases of ulcer of the lesser curvature, 72 showed definite niches. There was a six-hour retention in about one-half the cases. In the cases of duodenal ulcer, localization was possible in 54 per cent and definite niches were seen in only four.

In 6 per cent of the cases a positive differentiation between benign ulcers and carcinoma could not be made at operation, and the diagnosis was possible only on histologic study. Carcinomatous degeneration in an originally benign ulcer was demonstrated in 1.4 per cent of the cases and multiple ulcers were present in 9.3 per cent.

The operative mortality of gastro-enterostomy was 6.5 per cent and that of resection 7.7 per cent. The most frequent cause of postoperative deaths is a lung complication such as embolism, pneumonia, or gangrene. The danger of the complications depends more upon the extent of the operation than upon the anæsthetic. In two cases with vicious circle which were operated upon favorable results were obtained. Jejunal ulcer was seen in eight of the author's cases and twelve times in cases of primary operation elsewhere. Since the adoption of absorbable suture material in 1917, only one case of jejunal ulcer has been seen.

In a study of late results it was found that 90 per cent of recurrences, jejunal ulcers, and other disturbances occur in the first four years after operation; hence statistics based upon results reported earlier than four years after operation are apt to be too favorable. In all forms of gastric ulcer simple gastro-enterostomy produces somewhat more than 80 per cent of early cures or improvement approximating a cure. Observations made over longer periods show about 75 per cent of cures. Radical operations show a similar early result with about 80 per cent of cures.

The sleeve resection is very satisfactory and has given a cure in 90 per cent of cases. The V-shaped excision is unsatisfactory. The end-results of the Reichel-Polya operation are yet to be reported. The X-ray after gastro-enterostomy showed complete

disappearance of Haudek's niche in six cases and its partial disappearance in two cases.

In cases of duodenal ulcer, gastro-enterostomy with or without the von Eiselsberg exclusion yields 65 per cent of cures. Resection yields better end-results in favorable cases of gastric or duodenal ulcer than gastro-enterostomy. Under unfavorable circumstances greater benefit is derived from a well-performed gastro-enterostomy.

CLAYTON F. ANDREWS, M.D.

Eusterman, G. B., and Senty, E. G.: Benign Tumors of the Stomach; Report of Twenty-Seven Cases. *Surg., Gynec. & Obst.*, 1922, xxxiv, 5.

The twenty-seven cases reported were observed in the Mayo Clinic between 1907 and 1921. During this period 2,168 malignant tumors of the stomach were operated on. Of all neoplasms coming to operation 1.3 per cent were benign. Seventeen were classified clinically as primary growths because they were found to be the chief cause of the patients' complaint. The tumors included myomata of various types, fibromata, hæmangiomata, dermoids, polypi, an adenoma, and polyposis.

The sexes were about evenly represented. The patients' ages ranged from 8 to 67. One-half of the patients were more than 40 years of age. In thirteen cases the tumors were in close proximity to the pylorus. In five they were on the posterior wall, in five on the anterior wall, and in two, distributed throughout the stomach. In one case the œsophagus and jejunum were involved. The tumors varied considerably in size and shape. The majority were sessile.

The symptoms and gastric analysis offered little aid in the diagnosis. Practically all the smaller tumors were symptomless. Seven patients had palpable tumors. The average weight loss was 25 lbs. Ten patients had recurring hæmorrhage and associated anæmia and weakness due chiefly to ulceration or erosion of a portion of the tumor. Three of the four patients with angiomata had severe bleeding and anæmia. Seven patients had obstruction, including one with a fibroma on the posterior wall of the stomach which had caused intussusception of the wall into the duodenum. In several cases in which a tumor near the pylorus had a ball-valve action there were severe painful seizures simulating gall-stone colic. Myomatous tumors of the pylorus, with or without pyloric obstruction, caused a syndrome similar to that of duodenal ulcer. The larger tumors could not be distinguished from carcinoma by the X-ray.

The evidence in cases of benign tumors of the stomach favors the diagnosis of gastric cancer, but a palpable mass, food retention, and six-hour barium retention are less frequent than in carcinoma. Often patients with benign gastric tumors are refused operation because the condition is regarded as malignant and inoperable. The true nature of the lesion is discovered only when they insist on operation. The surgical end-results are excellent.

O. S. PROCTOR, M.D.

Masson, J. C.: *Cancer of the Stomach*. *Canadian M. Ass. J.*, 1921, xi, 924.

Thirty-eight per cent of the deaths from malignant disease are due to cancer of the stomach. The first attempt at surgical removal was undertaken by Péan in 1879. If operation is done early a cure may result if the disease is limited to the stomach, and even when secondary involvement has taken place life is lengthened.

From the point of view of complete cure it is probable that cancer of the stomach is surgically the most favorable type of internal cancer. The author believes that the attitude of pessimism and indifference is due to the high operative mortality and the short life expectancy after radical surgery on patients who come to operation too late. The education of the profession and the laity with regard to the necessity of early operation will bring a decided decline in the death rate.

Most cases are curable if radical treatment is carried out when the symptoms first appear, or when the patient first comes under medical observation. The only exceptions to this principle are growths close to the cardia. These, however, comprise only about 6 per cent of gastric neoplasms. The most the surgeon can expect in late cases is to relieve obstruction and prolong life for a few months or possibly a year or two.

Of 1,912 patients operated on for carcinoma of the stomach at the Mayo Clinic from January 1, 1910, to January 1, 1921, 1,500 (78.45 per cent) were males and 412 (21.54 per cent) were females. The average age was 53.7 years.

Social environment, occupation, and the use of tobacco or alcohol do not have a decided influence on the production of cancer of the stomach. A large percentage of the 1,912 cases of cancer were those of farmers and farmers' wives. Constant overeating, probably more common in rural communities than in cities, especially of coarse, hot, or improper foods, may cause mechanical irritation or upset the chemistry of the stomach. Trauma is undoubtedly the most important etiological factor in the production of cancer in any organ. This may be mechanical, chemical, parasitic, or biochemical, and is especially dangerous if continued over a long period of time. By feeding rats with parasitically infected foods Fibiger was able to produce new growths of a cancerous nature. External trauma may be responsible for bringing a latent process into activity. On the other hand, sarcomata are probably often caused by a single injury.

Unsanitary conditions of living and lack of personal hygiene no doubt exert an influence. Rosenow has shown that infections of the mouth and throat are responsible for a large number of gastric ulcers. Masson believes that in a large percentage of cases ulceration is the forerunner of malignancy in the stomach or elsewhere. Other predisposing causes are tuberculous ulceration, syphilitic ulceration, and actinomycosis. The part played by heredity is still in doubt.

The symptomatology of gastric cancer is very complex. The cases may be divided into two main groups: (1) those with a long history of gastric disturbance, typical or atypical of gastric ulcer, with the recent development of malignancy, and (2) those without a previous history suggestive of benign ulceration. Definite symptoms upon which an early diagnosis of cancer of the stomach can be based are still unknown. By early cases the author means those considered benign clinically and in which the diagnosis is made only after the removal of tissue. Of 1,147 patients operated on for gastric ulcer at the Mayo Clinic in the past ten years, malignant changes were found by the pathologist in 253 (18.07 per cent).

A tumor of sufficient size to be palpated must be of several months' duration, but many of these are still confined to the stomach and many five-year cures are obtained by operation. Operation saves also an even larger number of patients from death by starvation due to gradually increasing obstruction. Such persons enjoy from one to three years of comparatively good health and die a slow death from cachexia without much pain.

The examination of a patient with a gastric complaint is not complete without thorough roentgenographic studies. As the number of reliable roentgenologists increases, the number of early operations for cancer will increase and there will be a corresponding decrease in the mortality statistics of this disease. Modern roentgenologists are able to discover about 95 per cent of gastric tumors, and are of great aid in determining their operability. The roentgenologist must frequently decide whether an ulcer is in the stomach or duodenum. This is important because duodenal ulcers rarely become malignant, while the tendency for gastric ulcers to become malignant is beyond dispute.

The differential diagnosis of malignancy of the stomach presents many difficulties. This is due no doubt to the fact that early cancer of the stomach in itself does not cause symptoms on which a diagnosis can be based. The author believes that the only cases in which a reasonably early diagnosis can be made are those with a history of gastric ulcer. The only patients with a good chance for cure are those on whom operation is performed before this change is noted clinically and in whom malignancy is found in only a limited area of the mucous membrane at the edges of a typical peptic ulcer. The percentage of gastric ulcers that become malignant will never be known.

Gastric cancers are of four types: (1) scirrhous, (2) medullary, (3) ulcerating, and (4) colloid.

A surgeon is not consulted in most cases until digestive disturbances are marked and very often not until pain is severe, obstruction is noted, or a tumor can be palpated. The condition is associated with more or less marked anæmia, loss of strength and weight, nausea, anorexia, and blood changes. Hæmatemesis or melena occurs probably in one-third of the cases.

The gastric contents, especially in cases of obstruction, show abnormal chemistry, occult blood, and Oppler-Boas bacilli. In early cases without obstruction free hydrochloric acid is frequently found, and in some cases it is in excess of the normal.

The author describes the examination of a patient in whom the disease is well established. If the patient's condition permits, the stomach and intestines should be empty in order to facilitate palpation. Unnecessary pressure should not be made as it may start hæmorrhage or cause perforation. In about two-thirds of the cases the tumor can be palpated, and from its position and degree of mobility valuable information is gained.

Pain varies with the amount of ulceration and the type of tumor, that due to the medullary or colloid type of growth being lighter. In advanced cases fluid may be present.

The author lays stress on the fact that so many family physicians delay consultation with the internist until a tumor, which they may have suspected, can be palpated. Moreover, many internists advise against surgery when a palpable mass is found, but later, if obstruction develops, advise palliative surgery. On the other hand, if surgeons neglected their duty to their patients and considered only the appearance of their mortality sheets, they would operate on fewer patients and have a much higher percentage of cures.

Seventy per cent of all cancers of the stomach are in the pars pylorica, 6 per cent in the pars cardia, and 24 per cent in the pars media. The closer the growth to the cardia the more difficult the operation. Obstruction, deformity of the stomach, and adhesions to other organs are all late sequelæ. Hæmorrhage occurs in 25 to 33 per cent of cases, and perforation in 4 per cent. Metastasis occurs early in some cases and relatively late in others. The amount of involvement of the lymph glands and liver is frequently out of all proportion to the size or apparent age of the local growth in the stomach.

In all early and questionable cases surgery is indicated. If the hæmoglobin is below 40, a pre-operative transfusion of 500 to 700 c.cm. of blood should be given and also, if indicated, regional or combined anæsthesia.

In conclusion the author urges that surgical diagnosis be made early in all suspected cases of cancer of the stomach; that special stress be laid on malignant changes in benign ulcer; that surgeons accept the responsibility and perform laparotomy before the patient's condition is such that it permits only palliative surgery; and that the laity be educated to the fact that cancer is curable in many cases if an early radical operation is performed.

J. E. STRUTHERS, M.D.

Walker, I. J.: Jejunostomy. *Boston M. & S. J.*, 1922, clxxxvi, 108.

The following are some of the indications for jejunostomy: (1) carcinoma of the œsophagus; (2) ulcer of the cardiac end of the stomach where re-

moval is impossible; (3) obstruction of the pyloric end of the stomach due to cancer or ulcer; (4) bleeding ulcer of the stomach or duodenum; (5) the nausea and vomiting of pregnancy when the uterus cannot be emptied safely; (6) persistent vomiting with localized peritonitis; and (7) intestinal obstruction.

Cases are given to illustrate Conditions 2, 5, 6 and 7. The Witzel-Mayo method of jejunostomy is the method of choice. Walker has been using a self-retaining catheter, about No. 18, French, in size.

Any case of obstruction in which the vomiting comes from the small intestine calls for opening of the bowel at the jejunum and not at any lower point. Early complete obstruction of the large bowel can be relieved by colostomy or ileostomy. In toxic paralysis of the bowel due to general peritonitis jejunostomy is more or less futile.

Jejunostomy is a simple surgical procedure by which intestinal gas and toxic material can be evacuated in cases of obstruction and through which nutriment, drugs, and fluids can be introduced.

CARL R. STEINKE, M.D.

Léri, A., and Deschamps, P. N.: Typhoid Perforation of Meckel's Diverticulum (Perforation typhoïdique du diverticule de Meckel). *Bull. et mém. Soc. méd. d. hôp. de Par.*, 1921, xlv, 1554.

The case reported was that of a woman 22 years of age. Death occurred without signs of perforation of the intestine but autopsy revealed peritonitis due to a perforation of Meckel's diverticulum. Histologic examination showed typhoid infection.

The authors have found only four similar cases in the literature. They explain the absence of symptoms of peritonitis by the fact that, because of its location, the diverticulum was covered by the mass of the intestines which separated the lower pelvis from the large peritoneal cavity and thus localized the infection.

In all reported cases of typhoid perforation of Meckel's diverticulum the lesion has been found in the apex of the diverticulum. This is due to the fact that the extremity of the diverticulum lacks a muscular coat, the mucosa being in direct contact with the serosa.

W. A. BRENNAN.

Sheldon, J. G., and Heller, E. P.: Rectal and Vesical Incontinence Relieved by Operation. *Ann. Surg.*, 1922, lxxv, 89.

The case reported was that of a boy 12 years of age who was born with an imperforate anus and had no control of the bladder. The anus was operated upon four times: two operations to fix the anal opening to the skin, one muscle-flap operation, and one "puckering-string operation," according to the statement of the boy's mother.

In November, 1919, Sheldon and Heller performed a muscle-flap operation. A strip of the gluteus maximus with its nerve supply (the inferior gluteal nerve) was freed on each side down to and including the periosteum where the muscle is

attached to the femur below the great trochanter. Each strip was then tunnelled around the rectum and the periosteal ends were stitched together posteriorly after they were crossed anteriorly. In this manner a circle of muscle was formed around the rectum. A rubber drain was inserted for twenty-four hours. At the end of the fourth week the patient had control of the bowels during the day and gradually the control became involuntary. The sphincter contracts independently of the remaining portions of the gluteus maximus.

A second operation was performed June 17, 1921, to correct the vesical incontinence. The urachus was found to be patent up to within 2 in. of the umbilicus, and both hypogastric arteries were pervious and of good size. These three structures were divided and ligated in front of the peritoneum at a level with the upper limit of the fundus of the bladder, the bladder was pushed well down into its proper position in the pelvis, and a circumcision was performed. On the second day the patient was able to retain 25 to 50 c.cm. of urine. On the fifth postoperative day there was almost complete control of micturition and an increase in the retention capacity of the bladder to 300 c.cm. Since his discharge from the hospital on the eleventh day the patient has had no recurrence of the enuresis. The cause of the urinary incontinence was believed to be the form and position of the bladder. The operation is shown by six plates.

In view of the operative findings and the result obtained in this case, the authors conclude that the position and shape of the bladder should be determined in all cases of urinary incontinence.

Regarding the rectal operation they state that the fibers of the gluteus maximus should not be severed, but should be detached with the periosteum at the site of insertion on the femur; the muscle flap should be ample, at least an inch in diameter, even in the cases of children; and, if possible, the nerve supply of the muscle flap should be investigated and retained even if a large portion of the muscle must be incorporated in the flap.

CARL R. STEINKE, M.D.

Kaiser, F. J.: A Continent Artificial Anus. A New Method: A Femoral Artificial Anus (Ueber kontinenten Kunstafter. Eine neue Methode: Anus praeternaturalis femoralis). *Beitr. z. klin. Chir.*, 1921, CXXIV, 548.

The application of pads in cases of artificial anus has not undergone any improvement worth mentioning, even with the modern advances in the methods; wearers of these pads still suffer much discomfort from intestinal contents and gases. Kaiser therefore attempted to form an artificial anus under muscular control. All of the methods already in use to obtain continence at the intestinal outlet were based on four principles: (1) the plastic construction of a closure apparatus of living tissue; (2) the bending of the intestine before its place of exit; (3) the mechanical narrowing of the intestinal pas-

sage; and (4) the formation of an artificial sphincter. Kaiser devised a femoral artificial anus which he claims is a decided improvement. This is made as follows:

The abdominal cavity is opened in the left hypogastrium by means of a typical muscle-splitting incision and it is then decided whether or not the sigmoid flexure is suited to the proposed operation, that is, whether it is long enough and free from adhesions and whether it shows any other changes such as carcinoma metastases. If all the conditions are favorable, the loop is divided at the end nearest the anus and both the afferent and efferent ends are aseptically closed. The mesosigmoid is then divided, the efferent loop is lowered into the abdominal cavity, and the mobile afferent loop of the sigmoid is brought under the skin and the upper part of the sartorius muscle. The region of the inguinal furrow and the uppermost part of the sartorius muscle is then exposed by the formation of a crescent-shaped flap, the fascia of the sartorius is split, and the sigmoid is drawn through under the muscle and brought out in the outer lower part of the reunited suture. If possible, the closed segment of intestine is kept closed for a few days to favor healing of the wound, and then a tube is introduced and the intestinal contents are evacuated with care not to contaminate the wound.

This method has been successful in practically all of the author's cases. The function is perfect and begins soon after the operation. The procedure has the following advantages over other methods (those of Schmieden, Maydl, Payr): (1) simplicity; (2) the utilization of the passive tension of the sartorius muscle for compression of the intestinal lumen in addition to its active influence; (3) the situation of the artificial anus in front; (4) the possibility of applying a pad which will hold firmly and can be raised without inconvenience; (5) the early development of the sensation of need to defæcate; (6) the possibility of combining this method, if desired, with other aids in obtaining continence; (7) the absence of intestinal prolapse; and (8) permanent patency of the artificial anus.

CREITE (Z).

Goldschmidt, W.: A Substitute for the Sphincter in the Formation of an Artificial Anus (Sphinkterersatz bei Anus praeternaturalis). *Zentralbl. f. Chir.*, 1921, XLVIII, 961.

Goldschmidt's method of forming a continent artificial anus is as follows:

After a colostomy has been performed in the usual manner and the peritoneal cavity has been closed off, muscle, fascia, and skin are sutured around the protruding intestinal end, part of the suture including the peritoneum. In the region of the afferent end, that is, at the site of the future artificial anus, two incisions 6 to 8 cm. in length are made on each side and about 1½ to 2 cm. distant from the intestine to form a strip of skin on the right and the left sides. From these strips two skin tubes are formed to enclose the future anus, and through them a rub-

ber drainage tube is passed. By means of compression the drainage tube is made to serve as a sphincter.

To date, the procedure has been used only in cases of inoperable tumors of the large intestine. Since the patients succumbed to their disease within a few months after the operation, the period of observation was relatively short and it is therefore unknown how long the sphincter substitute would have continued to function if the patients had lived.

DENCES (Z).

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Graham, E. A., and Peterman, M. G.: Further Observations on the Lymphatic Origin of Cholecystitis, Choledochitis, and the Associated Pancreatitis. *Arch. Surg.*, 1922, iv, 23.

Contact infection of the mucosa of the gall-bladder by bacteria carried down in the bile from the liver rarely produces deep infections of the wall. Moreover, cholecystitis is seldom hæmatogenous in origin. On the basis of these facts it is difficult to explain the association of appendicitis and other portal infections with cholecystitis because there is no direct path from the appendix to the gall-bladder by way of the blood stream.

However, one route between the appendix and gall-bladder which is comparatively direct is a "hæmatolymphatic" route, there being a very intimate lymphatic connection between the liver and gall-bladder. An infection of the liver would tend to spread to the gall-bladder by way of the lymphatics, and conversely an infection of the gall-bladder would tend to spread, not only to the liver, but also along the common duct to the pancreas. In this respect infections in this region would merely follow the rule of infections elsewhere in the body. In cases of cholecystitis there is also an associated inflammation in the liver. When this occurs secondarily to cholecystitis the right lobe of the liver is very much more affected than the left lobe, and the most marked changes are in the right lobe near the gall-bladder.

The authors explain the frequent association of appendicitis with cholecystitis on the basis of a primary infection of the liver from the appendix by way of the portal vein, and of a cholecystitis resulting secondarily by way of a lymphatic spread from the liver to the gall-bladder. They state that they have found evidence of hepatitis in association with appendicitis. This possibility suggests that, perhaps frequently, a vicious circle between the gall-bladder and liver is established whereby each may reinfect the other, and it forcibly emphasizes the desirability of cholecystectomy rather than cholecystostomy because by this means the vicious circle can be broken most readily.

The paper is splendidly and instructively illustrated.

MORRIS H. KAHN, M.D.

Friedman, G. A.: Tender Pressure Points with So-Called Symptomless Gall-Stones. *J. Am. M. Ass.*, 1922, lxxviii, 187.

It is the author's opinion that many cases of cholecystitis and cholelithiasis are symptomless or the symptoms are directed toward other pathologic conditions than gall-bladder disease. In so-called symptomless cases, however, there are certain signs which are pathognomonic of disease of the gall-bladder, viz., tender pressure points along the right axillary, scapular, and posterior median lines at the level of the gall-bladder. Patients may be divided into three groups: (1) those suffering from typical attacks of pain, (2) those suffering from atypical attacks of pain, (3) those who are free from pain but have symptoms of dyspepsia. The symptoms of those belonging to Group 1 are usually so clear that the diagnosis can be made correctly from the history alone. At times there is no abdominal rigidity, and the liver and gall-bladder may not be palpable. Thus, tenderness on pressure may be completely absent from the region.

The patients in Group 2 may exhibit all the symptoms of chronic peptic ulcer, but the possibility of gall-bladder disease may be vaguely suggested. The patients in Group 3 complain only of paroxysmal vomiting, sour eructations, flatulence, constipation, loss of weight, general weakness, etc.; Stiller's habitus may be present.

Tender pressure points are most always found in the intercostal spaces at the level of the gall-bladder in the continuation of the right axillary, scapular, and posterior median lines, even when no tenderness is present in the gall-bladder region proper. In dyspeptics of the third group these tender points are often overlooked. The points disappear when the gall-bladder has been removed.

In searching for these tender points, equal force must be applied on either side, especially in the cases of neurotic women. Their discovery in the dyspeptic without pain will lead to a correct diagnosis of gall-bladder disease existing either alone or as a concomitant condition in an otherwise clear case of gastric ulcer or chronic appendicitis.

Since gall-stones are rarely aseptic, the infecting agent has a tendency to settle in minute areas of the intercostal nerves. The inflammatory condition in these nerves is not severe enough to cause pain, but reaction occurs on pressure.

The eliciting of tender spots in the areas mentioned is not new in cases of gall-bladder disease, but they are hardly ever searched for in cases of dyspepsia presenting no symptoms referable to the gall-bladder.

WILLIAM J. PICKETT, M.D.

Behrend, M.: A Case of Chronic Jaundice Cured by a Lateral Anastomosis of the Common Bile Duct with the Stomach. *Pennsylvania M. J.*, 1922, xxv, 268.

Behrend describes a novel operation for the relief of chronic jaundice, viz., lateral anastomosis of the common bile duct with the stomach.

The peritoneal surface of the two structures are first united with linen thread. The common duct is then cut across its long axis and a corresponding incision is made in the stomach. The cut ends are united as in any other anastomosis.

In the case reported a large amount of bile was vomited during the first twenty-four hours after the operation, proving that the anastomosis was successful. Within twenty-four hours there was a marked decrease in the jaundice, and in forty-eight hours it had almost disappeared. The vomiting ceased after the first gastric lavage of sodium bicarbonate solution. The patient made an excellent recovery and although at times she experiences slight indigestion, she is usually able to eat any kind of food.

C. CORBIN YANCEY, M.D.

Mayo, C. H.: Jaundice from Pancreatic Disease.
Minnesota Med., 1922, v, 6.

In a consideration of jaundice due to pancreatic disease it is necessary to eliminate cases of hæmolytic icterus and those in which obstruction of the common duct is due to stone. Ducts empty into a viscus by an indirect route, usually by passing obliquely through its wall, an arrangement that provides for valve-like action and prevents back-flow. A circular muscle usually guards the exit. The common duct in its course grooves the head of the pancreas, passes obliquely through the wall of the duodenum, and just before entering the cavity of the bowel is joined by the pancreatic duct of Wirsung.

Jaundice is due to the presence of bile in the blood and is caused by any condition which interferes with the delivery of bile into the intestine. That absorption occurs by the lymphatics has been proved experimentally because jaundice does not occur if the chyle duct is ligated before the common duct.

The cause of jaundice may be a lesion anywhere in the biliary apparatus or in the pancreas, the underlying factor being clinical, infectious, or neoplastic. The association of the biliary and hepatic ducts is subject to certain variations. They may have separate openings into the duodenum, the duct of Santorini may be larger than the duct of Wirsung, or the two pancreatic ducts may fail to anastomose in the gland. Is it possible that the union of the biliary and pancreatic ducts renders the pancreas more vulnerable to secondary infection following infection in the gall-bladder and ducts? The function of the liver is essential to life. While the presence of bile in the intestine has a definite physiological purpose, its obstruction and resulting retention is not of itself a cause of death, though its absence may be a cause of serious discomfort.

As the pancreas partially or completely surrounds the biliary duct, any change in the gland caused by inflammation, sclerosis, or new growth may be the cause of obstruction and jaundice. The frequent association of inflammation in the pancreas with infection in the gall-bladder makes this of considerable practical moment, and in all operations on the

gall-bladder and ducts the size of the lymph glands and the duct and the condition of the pancreas should be recorded for future reference in case of recurrence of the disease. Insofar as digestion is concerned, the pancreas has a relatively large factor of safety because experimentally a large part of the gland may be destroyed without seriously interfering with digestive processes. Mayo believes that acute inflammation of the pancreas should be considered a chemical change due to toxæmia from the alimentary intake. The subacute and chronic forms are also chemical but result from microbic action. Operative experience further indicates that most of the chronic diseases of the pancreas and a few of the acute diseases are secondary to infections in the gall-bladder and ducts. In a small group of cases of acute and chronic infections the lesion is primary in the pancreas.

Disease of the gall-bladder is the result of chronic infection of its tissues. Mayo believes that the infection is carried to the gall-bladder by the bloodstream and results in septic infarction of the capillaries. It is probable that infection reaches the pancreas in like manner, although the gland may be involved secondarily through the duct association. The pancreas is usually the cause of the trouble when the gall-bladder is found greatly distended without obstruction in the cystic duct. The usual types of pancreatitis are:

1. Intralobular. Involvement of the outer part of the lobules produces a lumpy irregular enlargement of the head or of all the gland, and only in advanced disease affects the islands of Langerhans.

2. Interacinar. A diffuse enlargement of the gland occurs and frequently involves the islands; glycosuria is often present. This type may produce abscess or fat necrosis.

3. Hæmorrhagic. This type occurs as an acute abdominal lesion often associated with acute gall-bladder disease and jaundice or cysts of the pancreas. It is caused by bile in the pancreatic ducts which in some way starts autodigestion of the gland. Pancreatic disease may be the cause of pain or colic ordinarily attributed to the gall-bladder or stomach. The pain is usually deep in the right or left upper abdomen and may be associated with an intermittent diarrhoea. Jaundice may occur later when the bile duct is obstructed by the swollen pancreas. Cancer of the head of the pancreas may produce these symptoms.

The symptoms of obstruction to the bile duct due to the pancreas are jaundice, pain, indigestion, loss of weight and strength, acholic and fatty stools, a large distended gall-bladder, and occasionally a deep tumor. Metastasis may be recognized by the irregular and lumpy surface of an enlarged liver.

External drainage of the gall-bladder for a period of several weeks may be justifiable in certain inflammatory conditions of the pancreas. The syndrome of jaundice and a greatly distended gall-bladder occurring in middle or old age is usually due to malignant disease of the pancreas. In these

cases symptomatic relief is afforded and life may be prolonged preferably by cholecystoduodenostomy or cholecystogastrostomy which short-circuits the delivery of bile.

Jaundiced patients should have special pre-operative preparation consisting of blood transfusions and the intravenous administration of calcium. It is often advisable also to repeat these measures after the operation in order to lessen the tendency to bleeding. It is to be expected that the fistulous opening will remain patent only so long as the bile-duct obstruction is complete and persistent.

V. G. BURDEN, M.D.

Hitzrot, J. M.: The Surgical Treatment of Pernicious Anæmia. *Ann. Surg.*, 1922, lxxv, 31.

In general, two types of anæmia are classified as pernicious anæmia: the plastic and the hæmolytic. Five types of hæmolytic anæmia are given.

The forms of treatment of interest to the surgeon are blood transfusion, the eradication of foci of infection, and splenectomy.

The quantity of blood to be transfused is still a question for discussion. In Hitzrot's experience, frequently repeated small or moderate transfusions have been as successful as larger transfusions and are less apt to cause unpleasant reactions in the donor or the recipient.

Focal infections should be eradicated, but only organisms which have definite hæmolytic properties can be considered etiological agencies. In none of Hitzrot's cases was any organism grown from the spleen, and in only one case, in which there were a few suspicious teeth, were any foci of infection discovered.

In seven cases Hitzrot performed a splenectomy for pernicious anæmia. Three of the patients were benefited for periods of from one to four years, and three died within a year after the operation. In one case the operation was performed too recently to warrant a conclusion as to the outcome.

The position of splenectomy as a therapeutic measure in cases showing increased blood destruction is as yet unsettled. If the spleen is felt, its removal is indicated definitely. If the percentage of cells taking the vital stain is abnormally large, splenectomy should be considered. If the percentage of reticulated cells in the blood is less than normal, blood transfusion should be done. If this

increases the number of the reticulated cells, it increases the indication for splenectomy. If the cells are not increased by this means, splenectomy will not help. In the author's experience the reticulated cells are of more significance than the platelets.

Cases which show improvement following a transfusion and do not return to the previous low ebb seem to be benefited by splenectomy. Splenectomy is contra-indicated in the cases of elderly persons and those with spinal cord symptoms, and in the plastic cases.

Hitzrot urges early splenectomy if it is to be done at all.

CARL R. STEINKE, M.D.

Chalier, A., and Dunet, G.: Splenectomy Alone or Combined with Omentopexy in Banti's Disease—Four Observations with the End-Results (La splénectomie seule ou combinée à l'omentopexie dans la maladie de Banti—Quatre observations avec résultats éloignés). *Arch. franco-belges de chir.*, 1921, xxv, 112.

The interest in the cases of Banti's syndrome cited rests in the apparent cure of the disease at the time of observation several years after the operation. Attention is called to the three stages in the clinical evolution of Banti's disease. The first period, which may remain for many years practically non-progressive, is characterized by splenomegaly, discomfort in the side, pallor, and only slight functional disturbances. The second stage presents, in addition to the symptoms mentioned, a marked modification of the blood picture. There is a diminution of the red and white blood cells, particularly in the polynuclear leucocytes. In addition, the liver is slightly hypertrophied and digestive disturbances and urobilinuria with oliguria are present. The third or terminal stage is dominated by hepatic enlargement with progressive ascites, jaundice, and a hæmorrhagic diathesis.

The authors believe that splenectomy is definitely indicated and is sufficient to arrest the syndrome in the first and second stages of Banti's disease. In the third period with ascites an omentopexy should be performed in addition to the splenectomy. The pathology found in the organs removed at operation corroborates the accuracy of Banti's statement that the splenic lesion is primary.

LOYAL E. DAVIS, M.D.

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Lewin, P.: Osteitis Deformans (Paget's Disease), with a Report of Three Cases. *J. Bone & Joint Surg.*, 1922, iv, 45.

The author presents a report of three cases of osteitis deformans with a review of the disease from the time of Paget in 1876 to the present day.

Osteitis deformans or Paget's disease is a syndrome characterized by minor subjective symptoms but important objective findings of deformities chiefly in the skull and long bones. The disease occurs in late middle life.

In literature it is designated by various terms such as senile pseudo-rickets, fibrous osteomyelitis, localized osteomalacia, and hypertrophic osteosclerosis. American and English writers refer to it

as Paget's disease as it was described by Sir James Paget in 1876, who was unaware that it had been described as early as 1697 by Malpighi.

In the literature up to 1901 sixty-one cases were reported. In 1910 about 100 cases were found. The literature to date contains about 251 case reports.

The average age of onset was 48½ years. Males seem more predisposed to the disease than females. Heredity played a part in about 7 per cent of the cases reported. Race offers no predisposition. Many theories have been advanced as to exciting causes. The most important are as follows:

1. Syphilis. Paget did not regard syphilis as an etiological factor. He believed a chronic inflammatory process was the cause. Wassermann tests today are usually negative, and anti-syphilis treatment is of no avail.

2. Chronic infection. This theory had its advocates but Da Costa, Funk, and others attempted to make a vaccine and failed.

3. Neurotrophic disturbances. Various writers have advanced evidence to support this theory. The author believes that disturbances of the nervous system may be the underlying cause of a disturbance in metabolism.

4. Endocrine disturbances. No conclusive evidence has been offered to establish a relationship between Paget's disease and the endocrine system.

5. Metabolic disturbances. Metabolism studies have revealed a retention of calcium, magnesium, and phosphorus, and a pronounced loss of sulphur. These findings have been interpreted as indicating a stimulated osseous or osteoid formation associated with the absorption of a highly sulphurized organic matrix.

The pathologic changes are chiefly in the bones and may be generalized or local. The deformities most commonly found are outward and forward bending of the tibia, and next most frequently, similar bending of the femur. The joints are very seldom involved. Deformity is frequently noted in the lower extremity. The involvement is usually symmetrical, although cases have been reported in which the disease was limited to one-half of the skeleton.

In some cases the skull is involved. The entire thickness is composed of finely porous bone with a thin inner and outer plate of harder bone. The diploë is lost. Microscopically the porous substance consists of a network of thin bony processes. The haversian canals are confluent as a result of absorption forming Howship's lacunæ. Scattered areas of newly formed bony tissues are evident. The new osteoid substance remains uncalcified or is reabsorbed. The result of this regeneration and absorption is total destruction of all symmetry in the internal architecture of the bones. In long bones the normal relation of compact and cancellous structure is destroyed. The outer wall of hard bone consists of thin, irregular plates lying directly under the periosteum.

The author states that Paget's disease appears to be a combination of osteoporosis followed by osteosclerosis; that the condition begins as an osteomalacia with softening due to the abnormal relationship between various chemical substances in the bone. Osteosclerosis then supervenes and the cortex of the bone assumes a hard, ivory texture.

The onset of the disease is slow. Vague "rheumatic" pains are described by the patient. A gradual weakness of the lower extremities develops. Tenderness is revealed by palpation of the long bones. A gradual decrease in height may be noticed by the patient. Bowing of the extremities is then seen. The first symptom may be an increase in the size of the skull. The head usually becomes flexed on the sternum. A diamond-shaped deformity of the abdomen can be observed.

The X-ray reveals a rarefying osteitis with a thick cortex due to subperiosteal and new medullary bone formation. This thickening occurs on the convex surface. Bony striations may extend into the soft tissues. Areas of rarefaction develop.

The diagnosis is not difficult after deformity has occurred. Differentiation must be made from syphilis, osteomalacia, rickets, bone tumors, acromegaly, and diffuse hyperostosis of the cranial bones.

The prognosis is good as to life, but poor as to cure. Death usually occurs from intercurrent infection or malignancy.

At present curative treatment is impossible. Corrective treatment is inadvisable. Medication is of questionable value. The best hope today seems to be in phosphorus.

The author reports three cases. He concludes his article by describing the unusual aspects of one case which manifested marked deformity of the right lower leg, scleroderma, and fracture of the left forearm which showed non-union after twenty years.

JOHN MITCHELL, M.D.

Nuzzi, O.: *Surgical Tuberculosis* (Tuberculosis chirurgica). *Rassegna internaz. de clin. e terap.*, 1921, ii, 440.

In the different stages of its development surgical tuberculosis requires different methods of treatment. Operation must be performed neither too early nor too late. When the process is localized the body should be given an opportunity to mobilize its defenses, but in some cases the removal of the bacterial focus is necessary to prevent the further spread of the condition. The patient's age has a decided influence upon the evolution of the infection and should be taken into account by the surgeon in choosing the method of treatment. It should not be forgotten that the natural tendency in cases of surgical tuberculosis is toward recovery.

The purpose of orthopedic treatment is, first, to prevent malposition and ankyloses, and second, to correct vicious positions. The more economical operations are always to be preferred.

W. A. BRENNAN.

Israel, A.: Neuropathic Ossifications in Centrally Paralyzed Extremities (Ueber neuropathische Verknoecherungen in zentral gelahmten Gliedern). *Arch. f. klin. Chir.*, 1921, cxviii, 507.

Israel reports three cases of transverse paralysis of the spinal cord (one gunshot injury, a fracture of the vertebra, and a spinal cord tumor) in which he found periosteal, peri-articular, muscular, and epineural ossification. He cites also cases from the literature. Similar cases suggesting myositis ossificans following cerebral paralysis of one extremity have been reported.

The ossification is limited to the paralyzed areas. The parts in which nerve function is intact are not involved. The condition differs from progressive myositis ossificans in that only the paralyzed areas in the limbs are involved. The development of the new formation often follows rapidly several months or weeks after the injury.

The author compares the changes described with the peri-articular ossification in the arthropathies following tabes and syringomyelia. His observations refute the theory that myositis ossificans is always the result of tabes and caused by excessive mechanical exertion of the muscles due to ataxia, as all of his patients were paralyzed and therefore were unable to move.

In regard to the histogenesis of these ossifications Israel states that he observed here and there distinct transitions of the connective tissue into bone due to swelling of its cells and homogeneous change of the interstitial substance into true bone. Therefore he agrees with those who assume a metaplasia of the proliferated connective tissue cells in the development of myositis ossificans. Possibly the connective tissue cells in the paralyzed area undergo extensive differentiation. In Israel's opinion the findings reported in this article demonstrate that there is a typical tissue reaction in the paralyzed limb.

VON REDWITZ (Z).

Bianchetti, C. F.: A Clinical and Anatomopathologic Contribution to the Study of Chronic Traumatic Hygroma (Contributo clinico ed anatomo-patologico allo studio dell' igroma cronico traumatico). *Policlin.*, Rome, 1921, xxviii, sez. chir., 485.

Bianchetti gives the complete history of two cases of chronic hæmorrhagic bursitis and discusses the etiology, symptoms, and pathology.

The first case was that of a farmer, aged 58 years. The tumefaction in the left gluteal region had been present for more than three years. It caused only a sensation of weight after work and the formation of numerous varices but did not interfere with walking. At operation a tumor the size of an adult's head was removed. The condition was diagnosed correctly before operation as a chronic ischiatic bursitis probably of hæmorrhagic nature.

The second case was that of a farmer, aged 54 years, who had been operated upon for bilateral inguinal hernia seven years previously. About two

years later a painful tumefaction developed in the left inguinocrural region and the pain became more severe, especially during work. At operation a tumor the size of a hen's egg was removed from beneath the inner margin of the inguinal portion of the iliopsoas muscle.

According to Koenig, ischiatic bursitis is produced by strain upon the nates in hard manual labor. The serous bursa from which the lesion originates is usually the bursa situated beneath the gluteus maximus and between this and the ischiatic tuberosity and the muscles inserted in it. Although such a situation is exposed to injury, cases of ischiatic bursitis are not numerous in the literature. In Bianchetti's second case the situation of the tumor corresponded to that of the bursa described by anatomists as a bursa of the psoas muscle; there may be two bursæ here, one between the muscle and the small trochanter and the other between the muscle and the anterior ligament of the capsule. In the case mentioned the hygroma developed at the expense of the upper bursa.

In the first of the two cases described the condition might have been due to trauma. In the second this etiological factor could be ruled out and the only explanation for the condition is that following the previous hernia operation a thread of silk migrated deeply and caused a chronic inflammatory process in the perivascular tissue which ultimately spread to the contiguous bursa.

The author describes the three types of chronic bursitis: the serous, the proliferating, and the hæmorrhagic. Both of his cases were of the hæmorrhagic type. The histologic examination shows that in the majority of cases the primary lesion of the bursa is a hæmorrhagic pachybursitis. As in similar conditions of the vagina and testicle, the hæmorrhage is due to the fragility of the capillaries of the granulation tissue.

The differential diagnosis of a hygroma is sometimes extremely difficult as in the second of the author's cases. The hygroma, however, always develops very slowly and does not disturb the general health; it is only very late, in the ulcerative period, that its growth becomes irregular. After ulceration its growth ceases. A neoplasm, on the other hand, increases in size more constantly and rapidly and the patient's general appearance suggests neoplastic cachexia.

The author directs attention to the fact that the site of the tumor in his second case was unusual for a hæmorrhagic hygroma.

W. A. BRENNAN.

Salaghi, M.: Sprengel's Deformity, Congenital Elevated Scapula, Due to Costal Malformation (Contributo allo studio della deformità di Sprengel con un caso di scapola alta congenita da malformazione costale). *Policlin.*, Rome, 1921, xxviii, sez. chir., 521.

Salaghi's case was that of a girl 8 years of age. The ribs showed malformations, especially on the right side, and in the spine there was a slight cunei-

form crushing of the body of the fifth dorsal vertebra and approximation of the bodies of the fourth, fifth, and sixth dorsal vertebrae. Opposed to the primary spinal deviation toward the left, which extended from the fourth to the seventh dorsal vertebra, there were two corresponding compensatory curves toward the right. An embedding of the spinous processes due to the primary convex curve toward the left gave rise to lordosis of the segment. The scoliosis was somewhat different from the acquired type in which the lateral deviation is usually not associated with such a notable degree of reclination. Otherwise the condition resembled the acquired type in which there is cuneiform crushing of the vertebrae and discs. There was nothing to indicate a true malformation of the vertebrae, the deviation being due rather to the continuous action of pressure and traction. The author considered the costal malformations as primary and the spinal deviation as secondary. The right scapula was irregular as regards the spinal margin and showed a very wide supero-internal angle. Although elevated and slightly rotated with regard to the inferior angle, it could be lowered without difficulty as it was not held high by any fibrous cord binding it to the spine. There was slight left lateral flexion of the head due probably to increased muscular tension. This tension appeared clearly to be related to the right cervicodorsal compensatory curve and was the principal cause of the scapular elevation.

A surgical operation is not indicated in this case. The author intends to treat it by his method of manual reposition of the spine with which he has had many successful results in cases of adolescent scoliosis.

W. A. BRENNAN.

FRACTURES AND DISLOCATIONS

Tinker, M. B.: Wound Excision and Early Reconstruction in the Treatment of Compound Fractures. *Ann. Surg.*, 1922, lxxv, 38.

The author carried out experiments on wound excision and attempted to solve the following problems:

1. The possibility of disinfecting an extensively infected wound, especially an external wound, and thus prevent contamination of the clean excised area during excision.

2. The relative value of various antiseptics in killing bacteria and in penetrating lacerated and contused tissue.

3. The possibility of staining lacerated tissue so that it can be distinguished more clearly from the uninjured tissue.

With regard to the first problem it was found that Harrington's solution was superior to all others, and that formaldehyde solution and pure carbolic acid were of considerable value. Potassium permanganate could not be relied upon in spite of its strong oxidizing value. Dichloramine-T was also unsatisfactory.

With regard to the second problem, frozen sections of excised tissue showed that the antiseptic

penetrated deeply enough to care for practically all of the bacteria if the infection had not been in contact with the tissues too long to give it an opportunity to spread by the lymphatic or blood channels.

With regard to the third problem it was found that strong solutions of acriflavine, methylene blue, and a hot saturated solution of permanganate of potassium stained the tissues sufficiently to aid in the dissection of the injured area, but the permanganate solution was the most satisfactory.

The author urges the use of local anaesthesia in preference to general anaesthesia for wound excision and reconstruction surgery because it greatly reduces the risks, it saves anaesthetic drugs and the services of the special anaesthetist, and may be used in all cases in which the operative procedure is longer than one or possibly two hours.

Immediate or early skin grafting is advised because it saves a great deal of time in healing. Under local anaesthesia small deep grafts $\frac{1}{2}$ in. square or smaller are employed.

A pedicled flap of skin should be used when nerve trunks, tendons, or joints are exposed and when skin grafts do not offer sufficient protection. If possible, it should be turned from the immediate vicinity.

Suppuration of the tendon sheaths associated with compound fractures of the hand or forearm results in serious disability, while thorough wound excision or early effective disinfection often gives surprisingly good results. A tendon should be exposed either by an incision along the side or transversely in the line of the normal skin folds. Silk sutures give better results than catgut sutures. Physiotherapy should be begun after one or two, or at the latest three, weeks. Tendon-lengthening by various methods did not give as good results as direct suture even where it was necessary to hyperflex the involved joints in order to obtain apposition of the ends. In cases of adherent tendons, free fat transplants surrounding the separated tendons frequently give excellent results.

Peripheral nerve injuries are common in connection with compound fractures. Experience has shown that immediate nerve suture gives the best results, even in cases in which the wound becomes infected. Delayed nerve suture, neurolysis, and auto-transplants give fair results.

Carrel-Dakin treatment has proved to be of great value in clearing up infected compound fractures. Therefore in wound excision the sacrifice of bone should be restricted to the minimum. Exposed bone should be covered with a skin flap as soon as possible.

RUDOLPH S. REICH, M.D.

Burian, F.: The Treatment of Fracture of the Clavicle by Continuous Traction (Traitement par traction continue de la fracture de la clavicule). *Presse méd.*, Par., 1922, xxx, 17.

The treatment of fracture of the clavicle is difficult because of the difficulty of effecting immobilization. Couteaud allows the arm to hang vertically

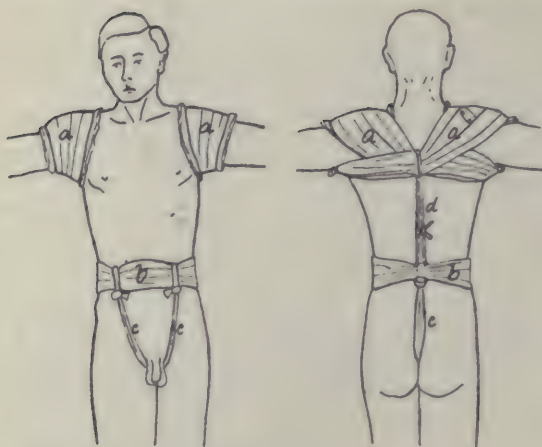


Fig. 1. a, figure-of-8 bandage; b, belt; c, band.

Fig. 2. a, figure-of-8 bandage; b, belt; c, band; d, rubber tube.

from the bed, a position which brings the clavicular fragments into contact, but the patient is very apt not to remain quiet long enough to permit consolidation of the fracture. Since the war, Burian has been convinced of the advantages of the ambulatory method of treating such fractures. To obtain continuous traction he uses Petit's figure-of-eight bandage.

With the patient seated on a stool the fracture is reduced under anesthesia and maintained by two assistants, one of whom, standing in front of the patient, keeps the arms in lateral extension and pushes them backward while the other supports the patient's back with his hands against the shoulders. The figure-of-eight bandage is then applied so that it crosses between the scapulae and the turns cover the upper and anterior parts of the shoulders. About six turns are necessary. Muslin 14 cm. wide is used. A muslin bandage is also applied at the waist and held in place by strips passed between the thighs. A thick rubber drainage tube is then passed under the two bandages in the median line of the back, stretched, and tied (See figure).

The necessary degree of tension of the rubber is easily found. When the arms are slowly replaced in adduction the patient should experience only a firm elastic traction which pulls the shoulders backward. At the end of two hours the position of the shoulders is examined and the traction corrected if necessary. If cyanosis of the arm is noted the traction is decreased or the bandage loosened. At night the patient should lie with a support under his back.

The reduction can be verified at any time as the area of fracture remains uncovered by the bandage. Consolidation should be effected within three or four weeks. At the end of that time the bandages may be removed and massage may be used.

W. A. BRENNAN.

Patel, M., and Badin, A.: A Study of Inward Luxations of the Elbow, Complete and Incomplete (*Étude sur les luxations du coude en dedans; luxations pures et incomplètes*). *Arch. franco-belges de chir.*, 1921, xxv, 62, 153.

The authors begin their comprehensive discussion of inward luxation of the elbow with a survey of the literature. Complete luxation of the elbow which is unassociated with fracture of the humerus or the bones of the forearm is rare. Inward luxation may be classed as incomplete since it is nearly always associated with a fracture. Only about sixty cases were collected from the literature and all of them antedated the use of the X-ray.

The authors report three cases of inward luxation with the complete roentgenological findings. In every instance the inward luxation was associated with a posterior luxation; that is, the posterior luxation was transformed into an inward luxation secondarily. These clinical findings corroborate the views of Denucé and Pingaud. In experiments on cadavers to confirm them it was found that the only procedure capable of effecting an inward luxation without fracture entailed a primary posterior luxation. The authors discuss the mechanism of the luxation theoretically.

The forearm is usually held in more or less marked flexion with some degree of pronation. The deformity is found on the inner side of the elbow and causes an increase of several millimeters in the transverse diameter. Palpation reveals that the three points of the dorsal surface of the elbow form an irregular triangle with the external side longer than the internal. The head of the radius cannot be felt.

If the condition is recognized and treated early, the prognosis is generally favorable.

The treatment of recent inward luxation consists in transforming it into a posterior-inward luxation by carrying the forearm into extension and then reducing the posterior-inward luxation by rotation and traction upon the forearm. In old luxations no interference is attempted if the existing function is compatible with active movement. When function is defective the presence of complete ankylosis dominates the indications for treatment.

LOYAL E. DAVIS, M.D.

Lambotte, A.: The Operative Treatment of Congenital Luxation of the Hip (*Sur le traitement opératoire de la luxation congénitale de la hanche*). *Arch. franco-belges de chir.*, 1921, xxv, 244.

In Lambotte's opinion the operative reduction of congenital luxation of the hip should not be abandoned entirely. He has operated successfully on numerous patients between 15 and 47 years of age. The oldest had a very decided bilateral luxation.

The use of Doyen's or Lorenz' apparatus for reducing the head of the femur is traumatizing. Lambotte therefore employs a special lever tractor and guides the femoral head into the acetabulum with a large spatula which is used like a shoehorn.

An angular antero-external incision is made from the iliac spine to the base of the great trochanter and then down toward the thigh. The muscles are separated and the thick capsule over the femoral head and neck is incised. The spatula is then passed into the acetabulum, the ligamentous attachments are widely incised, and the acetabulum is hollowed out with Doyen tubular instruments unless it is very large, when curettes the size of the femoral head, sharp on one side and blunt on the other, are used. The femoral head is then trimmed and corrected as necessary and the reduction effected with the aid of the lever and spatula. The traction necessary varies from 80 to 100 kgm. Neither preparatory continuous traction nor tenotomy has ever been necessary. The operation is as easy in the adult as in the child, and re-luxation after operation is very rare.

The technique is that which Lorenz formerly described, the only modification being the use of the tractor and reducing lever. In 1909 Lambotte showed before the Belgian Surgical Society a woman 26 years of age who was cured of congenital luxation of the hip by the method described.

W. A. BRENNAN.

Ashhurst, A. P. C., and Bromer, R. S.: The Classification and Mechanism of Fractures of the Leg Bones Involving the Ankle, Based on a Study of Three Hundred Cases from the Episcopal Hospital. *Arch. Surg.*, 1922, iv, 51.

In spite of all the classical writings of Pott, Dupuytren, and others, there is no entirely satisfactory classification of ankle fractures. Pott described a fracture which does not exist and Dupuytren commended him for his acute observation. A transverse fracture of the fibula 3 in. from the lower end, as described by Pott, is not found in any series of roentgenograms or postmortem specimens. Quénu states that the French mean by "Dupuytren's fracture" exactly what the English mean by "Pott's fracture." It is probable that this fracture is the common one first described accurately by Maisonneuve.

After a detailed description of the normal ankle joint the authors proceed to a discussion of the mechanism of fractures involving this joint and a classification based on 300 cases. In the production of fractures of the ankle, rotation of the foot around the long axis of the leg plays an important part. Inward rotation is almost inseparable from a movement of adduction and the foot is quite mobile in this direction. In outward rotation, however, the foot acts as a rigid lever. In relation to the tibia this is a lever of the first class with the fulcrum at the anterior border of the fibula, the power arm being the anterior four-fifths, and the weight arm the posterior one-fifth, of the distance from the posterior border of the ankle to the toes. With relation to the fibula, however, it is a lever of the second class with the fulcrum at the posterior border of the inner malleolus and the power arm the entire distance from

the posterior ankle border to the toes. The longer power arm exerts more force against the external malleolus than the shorter power arm exerts against the internal malleolus. The lower end of the fibula is thus fractured by a force which pries the malleoli apart. Of all fractures at the ankle this oblique one of the lower end of the fibula is the most frequent (25 per cent). If the rotation goes far enough, the tip of the internal malleolus is broken off. In the authors' series of 300 cases this type of rotation fracture, including all its complications and variations, occurred 100 times. In four cases the force against the internal malleolus was great enough to fracture the entire lower end of the tibia.

Forced abduction produces in most cases an isolated fracture of the internal malleolus. In the authors' series 6.5 per cent were of this type. If the tibiofibular ligaments hold, the fibula may be caused to break through its malleolus by the direct force of the abduction but never above these ligaments by bending. A bending fracture occurs only when the tibiofibular ligaments have ruptured; one end of the bone must be free and the other end fixed. In thirty cases of fracture of the surgical neck of the fibula the lesion showed the characteristics of fracture by bending in twenty-eight, and if it was not accompanied by rupture of the tibiofibular ligaments there was a history of direct violence or clinical evidence of severe sprain of these ligaments.

Not infrequently the posterior marginal fragment of the tibia is a distinct clinical entity. It was described by Cooper in 1820 but in 1915 Cotton described it as a "new type of ankle fracture" and by some writers it is referred to as "Cotton's fracture." The fragment varies from a small portion of the posterior lip to a large piece extending 10 cm. up the shaft, and there may be posterior displacement of the foot. The mechanism which produces it is a crushing force from below upward. This type of fracture occurred in fifty-eight of the 300 cases reviewed.

Forced adduction may cause splitting of the inner part of the tibial shaft but the more common lesion is a tearing off of the external malleolus followed by a crushing fracture of the inner malleolus.

The three abnormal movements of external rotation, abduction, and adduction are responsible for about 95 per cent of ankle fractures. It is impossible to classify these fractures anatomically because the variations in many instances are due only to variation in the force which produces them. The authors therefore offer the following classification based on the mechanism of the fracture:

	Per cent
A. Fractures by external rotation.	
1. First degree: lower end of fibula only (oblique)	26
2. Second degree: same, plus rupture of the internal lateral ligament or fracture of the internal malleolus	33
3. Third degree: same, plus fracture of the lower end of the tibia	1.7
Total	60.7

B. Fracture by abduction.	Per cent
1. First degree: internal malleolus only	6.6
2. Second degree: same, plus fracture of the lower end of the fibula (transverse)	13.7
a. Below the inferior tibiofibular joint	
b. Above the inferior tibiofibular joint (Pott's fracture, "Dupuytren type")	
3. Third degree: fracture of the whole lower end of the tibia	0.66
Total	21.
C. Fractures by adduction.	
1. First degree: external malleolus only	9
2. Second degree: same, plus the internal malleolus or the inner part of the tibial shaft	3.6
3. Third degree: same, plus the whole lower end of the tibia	0.66
Total	13.3
D. Fractures by compression in the long axis of the leg	2.7
E. Fractures by direct violence	1.7

On the basis of a roentgen-ray study of the ankle joint Bromer warns that in making a diagnosis of fracture of the posterior lip of the tibial articular surface one should remember that a supernumerary bone, the os trigonum, is sometimes present at this point. With regard to the diagnosis of tibiofibular diastasis by the roentgen ray the authors state that if the space between the lateral margin of the fibula and the lateral border of the anterior tibial tubercle exceeds more than two-thirds of the width of the fibula, it is most probable that there is diastasis of the first degree. Emphasis is placed on standardized accurate technique in roentgenography. Gross lesions are easily recognized by almost any method, but to attain the finer points in diagnosis an exact method of technique is necessary.

WILLIAM A. CLARK, M.D.

Wakeley, C. P. G.: Malunited Abduction Fracture of the Ankle Joint Treated by Operation.
Arch. Radiol. & Electrotherapy, 1921, XXVI, 229.

Lane and others have recently recommended operation as the best form of treatment for certain abduction fractures of the ankle joint.

A malunited abduction fracture of the distal end of the tibia and fibula was operated upon by the author five months after the injury. A transverse osteotomy of the fibula was performed through the line of fracture. A wedge-shaped piece of bone was removed through a curved incision exposing the tibial malunion, and the foot adducted. To retain the two portions in position a plate was fixed on the inner side of the tibia. The periosteum was carefully sutured over the plate, the wound closed, and the limb put up in plaster. After two weeks, massage and passive movements were begun. After six weeks the patient was able to walk without a cane and skiagrams showed good anatomical alinement.

Two and one-half years later the ankle movements were found to be full and free, and there was no sign of flat-foot or osteo-arthritis.

DANIEL H. LEVINTHAL, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Starr, C. L.: Army Experiences with Tendon Transference. *J. Bone & Joint Surg.*, 1922, IV, 3.

In the recent war the attention of surgeons was directed to injuries of the extremities and the possibility of restoring function by muscle transference. The problem presented was the redistribution of the active muscles to obtain balance and the restoration of the function of intact muscles.

Adherence to certain principles is necessary. These the author presents on the basis of a personal experience of several hundred cases:

1. As far as possible, muscles used to replace damaged muscles should have a similar action to the muscles they replace.

2. If a portion of a tendon is to be transferred it must have the same action as the muscle it is to replace. Half of the tendon of the extensor carpi radialis longior may be transferred to the long extensor of the thumb with good results. A hopeless result follows the transfer of half of the flexor carpi radialis to the extensor of the thumb.

3. The line of pull should be as straight as possible so that there may be no mechanical disadvantage.

4. Fixation of the transferred muscle must be effected under tension. This will take up the slack.

5. All deformities due to tissue contraction must be overcome before tendon transference is attempted.

6. The sheath of a muscle to be replaced may be used to receive the transferred tendon, but for the most part, transferred tendons should run in fatty subcutaneous tissue.

7. Tendons transferred in the lower extremity should be inserted into bone or periosteum. In the upper extremity, attachment of tendon to tendon is adequate.

8. The recipient tendon should be split and the transferred tendon stripped of its sheath and somewhat macerated. The transferred tendon should then be threaded through the slit in the recipient tendon, sutured in two places, and buried or turned back and stitched in itself. Linen is the most satisfactory suture material.

9. The limb must be immobilized for three weeks. Then a removable splint should be substituted. This is removed for training.

The training should be directed by an expert who has a thorough knowledge of anatomy and who has seen the operation. The best results have been obtained in the musculospiral nerve, probably because this nerve is for the most part a purely motor nerve and because the power necessary to overcome the disability is only that necessary to overcome gravity. The object of the operation is to restore the extensor function of the thumb, wrist, and fingers. The technique is as follows:

The arm is prepared in the usual manner. A 5-in. incision is made on the palmar surface of the forearm, between the flexor carpi radialis and palmaris longus tendons, ending at the wrist. The exposed tendons are freed from their sheaths to the middle of the forearm and divided at their insertion. The skin edges are clipped together. A 7-in. incision is then made on the dorsal surface of the forearm following a line from the external condyle of the humerus to the styloid of the radius. The lower end of the incision is slightly hooked to expose the thumb extensors. All bleeding must be controlled. If this incision is properly placed, it overlies the septum between the radial extensors of the wrist and the extensor communis digitorum. Blunt dissection will separate these muscles so as to expose the radius at the upper end of the incision. The insertion of the pronator radii teres into the outer surface of the radius is thus exposed. This tendon and the periosteum are freed from the radius with a periosteal elevator.

The extensores carpi radialis longior and brevior are slit and the freed end of the pronator teres is threaded through from the deep surface and its periosteal end sutured to the aponeurotic surface of these muscles. The tag ends are buried with a Lembert suture. The tendons of the common extensor to the fingers are freed from their sheath above the annular ligament and the separate sheath of the extensor minimi digiti is opened to expose all four tendons. The three extensors of the thumb are exposed at the lower end of the radius. The long extensor of the thumb is lifted from its bed and brought alongside the extensor ossis metacarpi and the primary extensor of the thumb. The flexors are then brought through a tunnel made through the subcutaneous tissue between the upper end of the palmar incision and the lower end of the dorsal incision. The three exposed thumb extensors are split and the palmaris longus, freed of its sheath and all areolar tissue, is threaded through all three and stitched to each with sufficient tension to keep the thumb extended.

The four common extensors are similarly slit and the prepared flexor carpi radialis is threaded through. The end of the transferred tendon may be buried in the extensor minimi digiti or turned back on itself and stitched to each tendon and then to itself. The fingers and wrist must be kept in hyperextension during this procedure. The fascia is not sutured, but an attempt is made to cover the exposed surfaces of the tendons with fat by bringing the skin edges together with a subcutaneous suture. A plaster-of-Paris splint is put on for three weeks.

Tendon transference was done for various disabilities in about 300 cases. In fifty-two cases re-examined after a period of from three months to two and three-fourths years the results were found to be excellent in twenty-nine cases, good in fifteen, fair in seven, and poor in one.

JOHN MITCHELL, M.D.

Kalima, T.: Pathologico-Anatomical Examination of Ankylosed Joints Mobilized by Operation (Pathologisch-anatomische Untersuchungen an operativ mobilisierten ankylotischen Gelenken). *Beitr. z. klin. Chir.*, 1921, cxxiv, 143.

The author made pathologico-anatomical examinations of eighteen specimens from operations performed by Payr for the mobilization of joints. With the exception of one case of multiple arthritis deformans the ankyloses were due to war injuries, suppuration by extension, or metastatic gonorrhoeal or other infections. The material included fourteen knee joints, three hip joints, and one elbow joint. The time that had elapsed between the disease which caused the ankylosis and the mobilizing operation varied from eight months to fourteen years.

Macroscopically the ankylosed joint and its vicinity showed more or less cicatrization. In most cases the ankylosis was so firm that either no movement or only slight elastic passive movement was possible. The connection between the surfaces of the joint was cartilage, cartilaginous bone, or true bone. The parts of the cartilaginous surfaces not directly involved were less altered, but the cartilaginous tissue within the area of ankylosis showed very great alteration in the form of so-called "asbestos" cartilage, i.e., the cartilaginous layer uniting the opposing surfaces, which in the operation were torn apart, displayed an uneven, jagged surface of whitish, somewhat translucent appearance. In two cases there was a marked production of osteophytes inside and near the cartilaginous connective tissue wall which bounded the asbestos-like ankylosed surfaces posteriorly. Inflammatory processes were never found in the bone tissue of the extremities of the joint. While the ligamentous apparatus showed the least alterations macroscopically, the capsular ligament and the peri-articular tissues were markedly changed. The capsule was solid and firm; in some parts it was $1\frac{1}{2}$ cm thick and streaked with adipose tissue.

The microscopic examination of the preparations, most of which were formalin-hardened specimens, was made chiefly on the cartilaginous parts of the joint ends. Regardless of the etiology of the various ankyloses the picture was uniform. The strongest organization and substitution processes were formed within the region of the ankylosis itself, while the surfaces not involved in the ankylosis showed alterations only in spots.

The substitution of cartilaginous tissue, which in general was greatly degenerated, proceeds from the articular surface by granulation tissue rich in cells and from the bone marrow. According to the variety of the substitution of the cartilage, the ankylosis was fibrous, fibro-osseous, or purely osseous. The production of osteophytes, so far as it consisted of purely marginal osteophytes, is traced back to periosteal formation. The author attributes the periosteal inflammatory process to the primary trauma or to periosteal splintering due to the inflamma-

tion. Intra-articular new bone formation, of which the end-result is osseous ankylosis, results from bone formation by bone marrow elements which have penetrated the cartilage.

In two cases the intra-articular production of osteophytes was traced back to the fact that the osteophyte was primarily a free traumatic loose body of the joint. In the inner ligamentous apparatus of the knee joint the alteration was least, with the exception of thickening of the fibrils and hyalin or adipose degeneration. The capsular portions, however, showed microscopic changes of most diverse forms: fibrous and cicatricial transformations, hyalin, adipose, and gelatinous degeneration, thickening of the vessels, and thrombosis.

The author is of the opinion that these investigations sustain Payr's radical position regarding the mobilization of ankylosed joints. **HOMER (Z).**

Van Neck, M.: Supracondylar Femoral Osteotomy in Extensive Infantile Paralysis (L'ostéotomie fémorale sus-condylienne dans les paralysies infantiles étendues). *Arch. franco-belges de chir.*, 1921, XXV, 247.

Some persons affected with infantile paralysis can keep their equilibrium and even walk without the aid of apparatus. Others are unable to use the limb. The difference is due to the fact that in the first type of case the center of gravity can be made to fall in front of the knee by inclining the thorax, while in the second this is impossible because of involvement of the lumbar and buttock muscles.

The surgical problem in such cases is to make the center of gravity fall in front of the axis of the knee when the body is not bent forward. Lorenz was the first to devise an operation to throw the axis of the knee backward. By a supracondylar femoral osteotomy he placed the leg in genu recurvatum. This was done by Van Neck in four cases after necessary tenotomies and correction of the foot. Two of the patients are now able to walk without any apparatus, one walks well with the aid of a cane, and one is able to walk with an orthopedic shoe.

W. A. BRENNAN.

Pieri, G.: Tibio-Astragalar Disarticulation with an Anterior Hypocinematic Strip (Disarticolazione tibio-astragala a lembo anteriore ipocinematica). *Chir. d. organi d. movimento*, 1921, v, 550.

Disarticulation of the foot is not often done because frequently the tibio-astragalar articulation is invaded or because, when the soft parts are not in good condition, the surgeon prefers supra-malleolar amputation which favors the formation of the classical posterior, internal, or postero-internal cinematic strips.

Disarticulation of the foot is preferable to supra-malleolar amputation because it gives a longer stump which does not require the use of complicated orthopedic apparatus and the weight of the body is better supported by the cinematic soft-part covering of the stump. This operation is possible and will

give good results even when only the soft parts on the dorsum of the foot are preserved as in such cases the stump may be covered with a single anterior strip or a smaller anterior strip and two postero-lateral strips. Cases of extensive freezing, ischaemic gangrene, or subtotal traumatic destruction of the foot, which heretofore have been considered by the majority of surgeons as typical cases for supra-malleolar amputation, are quite suitable for disarticulation.

When there is an indication for disarticulation of the foot and it is feasible to cut a posterior strip (the strip of choice), it is advisable to make the disarticulation with the Syme incision and to create a cinematic hood for the stump by means of a tibio-fibular tendinous loop, suturing the Achilles tendon either alone or with the other flexor tendons to the antagonistic tendons. The steps of the technique are: (1) a dorsal incision circumscribing a long cutaneous strip which usually does not extend beyond Lisfranc's tarsometatarsal interline; (2) dissection of this strip for about 2 cm. from the underlying soft parts, incision of the soft parts to the bone, and elevation of the strip with the dorsal tendons to expose the articulation; (3) tibio-astragalar disarticulation; (4) sectioning of the deep posterior tendons as low as possible, disinsertion of the Achilles tendon, and ligation of the vessels; (5) malleolar section; (6) adaptation of the anterior strip over the articular surfaces and suturing of the anterior to the posterior tendons; (7) suture of the skin and plastic repair.

Good results were obtained by the author in three cases. **W. A. BRENNAN.**

Schultze, F.: The Various Forms of Flat-Foot and Their Treatment (Die Einteilung des Plattfusses in seine einzelnen Formen und deren Behandlung). *Ztschr. f. orthop. Chir.*, 1921, xlii, 15.

On a pathologico-anatomical basis the author classifies flat-foot into the following varieties:

1. The muscular form. The tension of the arch becomes relaxed and the foot becomes flattened because of the greater action of the posterior group of muscles as compared with the anterior group. This condition is curable at first, but later, after contraction and stretching of the ligaments, becomes permanent.

2. The ligamentous form, an advanced stage of the muscular form.

3. The osseous form with bending of the longitudinal axis of the foot, a form developing from the ligamentous form. The entire foot is flat, the talus and calcaneus are rotated around the longitudinal axis, the anterior portion of the foot is in abduction, pronation and supination are suspended, and the patient has a stamping gait.

The muscular form must be treated by systematically exercising the muscles, flexing the sole with the toes, particularly the great toe, and during the intervals holding the foot in supination. The second and third forms are to be treated by compression

and reduction. The anterior part of the foot must be placed at the correct angle with the posterior part. The author describes the technique. The position of the toes must be corrected in plaster of Paris. A foot-plate should never be used.

GRASHEV (Z).

Mayer, L.: The Treatment of Paralytic Flat Feet.
J. Bone & Joint Surg., 1922, iv, 39.

The author classifies paralytic flat feet on the basis of the muscles weakened and the extent of the paralysis as follows:

TYPE 1. This group comprises cases of isolated paralysis of the tibial anticus. Inversion is impossible when the foot is dorsiflexed, but possible when it is below a right angle. To be sure that complete paralysis has occurred it is necessary to immobilize the foot in calcaneovarus, thus bringing the origin and insertion as near together as possible. If the Achilles tendon is shortened, it should be divided. Immobilization should be maintained for six weeks. If by this time there is no return of function, complete paralysis may be assumed. If there is the least sign of function the immobilization should be continued but exercise and massage should be given. Plaster should be used for the first six weeks and then a brace.

TYPE 2. This group includes those of the first type in which the anterior tibial is completely paralyzed and those in which there is partial paralysis of the anterior tibial with some weakness of other inverting muscles. Operation is necessary.

The author's study of muscle balance has shown that the tibialis anticus acts as a strong inverter when the foot is below an angle of 90 degrees. On further dorsiflexion it acquires a slight abducting power. When the action of the Achilles and anterior tibial were combined, marked inversion of the dorsiflexion resulted.

The rule followed by Mayer is that the inverters should slightly outbalance the everters.

Tendon transplantation is resorted to in the second type of cases. In those which are mild the extensor proprius hallucis is used, and in those more severe, the peroneus longus.

The insertion of the paralyzed anterior tibial tendon is exposed, and then the upper end of the tibial sheath. A threaded probe is passed down through the sheath until it emerges at the insertion of the tendon. The tendon to be transplanted is then exposed and drawn downward through the sheath of the anterior tibial by means of the guide suture. Since adhesions will occur when the tendon crosses the anterior intermuscular septum, a fascial plastic is employed when the peroneus longus is transplanted. In this plastic operation a trapdoor flap is cut in the fascia of each muscular compartment, the fascia is everted, the two fascial edges are united by means of a Lembert suture, and the transplanted tendon is attached to the bone at the insertion of the tibialis anticus. Within sixteen days there is physiological fixation of the tendon and active exercise may be begun.

TYPE 3. This group includes cases in which there is complete paralysis of all inverters except the Achilles. The treatment still remains unsatisfactory. In one case the author transplanted the extensor longus digitorum to the inner side of the foot. The result was gratifying. In four cases the extensor proprius hallucis was transferred in addition to the peroneus longus. These results were not so satisfactory.

TYPE 4. In cases belonging to this group there is complete paralysis of all inverters including the Achilles tendon. The type is rare. Of the methods of treatment the author prefers bone stabilization.

The after-treatment of all cases demands the use of suitable appliances until the weakened muscles have regained their maximum strength. Post-operative muscle training must be employed. A night splint of plaster or celluloid should be applied.

JOHN MITCHELL, M.D.

SURGERY OF THE SPINAL COLUMN AND CORD

Jacobaeus, H. C.: On Insufflation of Air into the Spinal Canal for Diagnostic Purposes in Cases of Tumors in the Spinal Cord. *Acta med. Scand.*, 1921, lv, 555.

Insufflation of air into the spinal canal to replace the fluid removed in cases of tuberculous meningitis was first used in 1909 but was without benefit.

Jacobaeus first insufflated air for diagnostic purposes in a case of spinal cord tumor in July, 1919. He has since used the procedure in three other cases with positive results and in a few with negative results. There was no difficulty in showing the air column, but it was very difficult to obtain an easily visible upper limit. After the withdrawal of 20 to 30 c. cm. of cerebrospinal fluid, a corresponding quantity of air or oxygen-gas was injected with an

ordinary 20-c. cm. Record syringe. In the cases in which a tumor was found the pain was very slight. In those in which no tumor was found a severe headache persisted for several days.

The first case was that of a man 43 years of age from whom an extradural neuroma opposite the eighth dorsal vertebra was removed. Three months after the operation his general condition was slightly improved but the spasticity and limitation of motion in the legs remained unchanged.

The second case was that of a man 53 years of age from whom an intradural neuroma opposite the ninth thoracic vertebra was removed. Two months later he was discharge from the hospital much improved from the standpoint of mobility but the sensory disturbances were only slightly improved.

The third case was that of a man 40 years of age from whom a fibrosarcoma of the dura mater involving the arches at the fourth and fifth dorsal vertebræ was partially removed. The patient was discharged from the hospital about ten weeks later not much improved. Six months later he was considerably improved and could walk quite a long distance without becoming tired.

In Cases 2 and 3 the upper limit of the air column corresponded well to the lower limit of the tumor as found at operation. In the third case the air column stopped somewhat below the lower limit of the tumor. It is not known whether this was due to adhesions or a too-small quantity of insufflated air. The results already obtained, however, indicate that this method may be of definite value in the topical diagnosis of spinal tumors. While errors may be made when, for some unknown reason, the air does not extend quite up to the tumor, distinctness of the air column indicates the absence of a spinal cord tumor.

CARL R. STEINKE, M.D.

Thorburn, W.: The Diagnosis and Treatment of Intrathecal Tumors of the Spinal Cord. *Brit. M. J.*, 1922, i, 49.

In a very interesting article the author lays stress upon the fact that in the treatment of intrathecal tumors of the spinal cord we have one of the most reliable developments of the surgery of the nervous system. He reports two cases in detail, one typical, the other less typical. In the differential diagnosis the following conditions must be considered:

1. Conditions arising as the result of hæmorrhage. These are generally associated with a history of injury.

2. Tuberculous disease of the spine. This may be differentiated by radiological studies. Attention is drawn here to the fact that local tenderness revealed by tapping the spinal processes and even local kyphosis may be present in cases of intrathecal growths.

3. Malignant growths in the vertebræ themselves. These, however, are usually secondary and the finding of a primary growth elsewhere leads to the correct diagnosis.

4. Syphilis. This may be excluded by the usual methods.

5. Growths, tuberculous masses, and cysts.

In cases of intrathecal tumors of the spinal cord pain as an early symptom is of importance. This may, or may not, be associated with paræsthesia with a certain degree of anæsthesia. The pain may be explained by the clinician as rheumatic or of visceral origin, but more careful study leads to the correct diagnosis.

The diagnosis having been made, it is important to localize and remove the growth. Localization demands: (1) careful examination to ascertain the highest level of sensory or motor phenomena; (2) a knowledge of the distribution of the spinal segments; (3) recognition of the relation of these segments to the spinal processes; and (4) correct

enumeration of the spinal processes themselves. A great majority of intrathecal tumors lie below the brachial and above the lumbar enlargement and can be easily shelled out.

Pathologic reports of growths removed vary greatly, though probably they all arise from the dura, pia, or arachnoid.

From the less typical case history the author draws attention to: (1) the importance of exploring doubtful cases of transverse lesions of the cord; (2) the fact that exploration does no harm even if the diagnosis is incorrect; (3) the possibility of arresting many cases of transverse myelitis by incision and drainage of the dura mater if, as he holds, such myelitis is often due to infection spreading along the nerves and then necessarily crossing the meninges and intradural space before the cord itself is attacked.

In Thorburn's opinion the infections are usually derived from the urinary organs. This theory agrees with the tendency of transverse myelitis to attack levels connected with the kidneys and also with the fully recognized tendency of the kidney to collect and harbor organisms of all types.

M. R. FLYNN, M.D.

Cyriax, E. F.: Partial Spondylolisthesis or Minor Displacement Forward of the Fifth Lumbar Vertebra. *Med. Press*, 1922, n.s. cxiii, 10.

Partial spondylolisthesis (slight forward displacement of the fifth lumbar vertebra) is very common. It usually comes on slowly, taking months or even years. Of the thirty-four cases cited by the author thirty-two were those of females and twenty-five of the latter had not had children. There was a history of anæmia in twenty, of rickets in six, of infantile paralysis in two, and of some other paralytic affection in childhood in three. In three cases the condition was of traumatic origin. In fourteen there was concomitant lordosis, and in five cases, scoliosis.

The symptoms depend upon the degree of compensation for the changes. Persistent backache develops in the area of displacement and is markedly increased when pressure is applied over the fifth lumbar vertebra in a direction which increases the deformity. Usually there is an abnormal depression just above the top of the sacrum. Other postural changes may be present. Nervous changes may develop because of the pressure on the sympathetic nerves in the lumbar region at this point, but the author has never observed symptoms pointing to pressure on the spinal nerves.

The treatment is the same as for displacements elsewhere, namely, reposition with after-treatment by mechanotherapeutics to strengthen the affected articulations. The longest treatment given by the author consisted of twenty manipulations for reposition, and the shortest of two. In no case did the deformity recur. Gynecological and rectal conditions must also be taken into consideration.

F. W. CARRUTHERS, M.D.

Bachlechner, K.: Operative Ankylosis of the Spine in Tuberculous Spondylitis (Zur operativen Versteifung der Wirbelsäule bei tuberkulöser Spondylitis). *Beitr. z. klin. Chir.*, 1921, cxxiv, 655.

In answering the question whether, in tuberculosis of the spine, ankylosis should be effected by bone bridging, the cases of importance are those in which the end-result of the bone implantation can be seen at autopsy. Up to the present time two cases have been reported by Meyer from the Biesalski Clinic and one case has been reported by Goerres in which examination showed an absolutely firm bony union between the inlay and the spinous processes.

The author reports the case of a patient who died eight weeks after the operation. At autopsy the part of the implant not covered with periosteum was found to be fused with the spinous processes, but its periosteal side was not fused even at its free border though it was impossible to loosen the implant from the spinous processes.

Bachlechner states that in certain movements of the spine, flexion forward and backward, the implant becomes very firmly united with the vertebrae, but a rotary flexion at the lower portion may easily cause its fracture. It is evident, therefore, that rotary movements must be prevented.

VORSCHUETZ (Z).

Gobbi, L.: A Case of Lumbosacral Bone Tumor (Un caso di tumore dello scheletro lombosacrale). *Arch. ital. di chir.*, 1921, iv, 519.

The patient whose case is reported was a girl who came to the hospital with a diagnosis of Pott's disease of the fourth, and sacralization of the fifth, lumbar vertebra. About a year previously she had fallen on the sacral region. Some months later pain was experienced in the right malleolar region and knee and finally became localized and intensified in the lumbosacral region where a large fluctuant lump could be felt. Hemorrhagic fluid was withdrawn several times by exploratory puncture. As puncture was insufficient to relieve the tension, an incision was made over the tumor. A large quantity of grumous, bloody fluid escaped. Deep exploration of the focus revealed involvement of the sacro-iliac articulation. Following this operation the patient's condition improved and she left the hospital. At a subsequent examination her general condition was found the same as before but locally a neoformed tissue beneath the skin and evidently of deep origin was discovered. This constantly increased in size. Sections were removed for histologic examination. The patient ultimately died of bronchitis and nephritis.

In this case, despite the almost total destruction of the sacrum, there were practically none of the vertebral osseous symptoms usually associated with spinal tumors. The radicular symptoms were almost entirely sensory disturbances until very late when there were bilateral sciatic pains and nearly complete anesthesia of the soles of the feet. Medullary symptoms were almost entirely lacking.

The principal objective signs were anæmia, progressive emaciation, and cachexia. Finally there was reason to suspect an intestinal metastasis of the neoplasm in the form of a hard, palpable nodule in the hepatic flexure of the colon. There were then painful attacks of colic accompanied by diarrhoea.

As there was no autopsy, histologic examination was limited to biopsy. The neoplastic tissue showed fibrosarcoma with cartilaginous islets in various stages of development. Two types of connective tissue cells were demonstrable: fusiform cells of connective tissue and cartilage cells. Hence the structure was that of a fusocellular chondrosarcoma.

The author gives a number of histologic illustrations and reviews the history of this type of neoplasm.

W. A. BRENNAN.

Lupo, M.: Vicious Sacralization of the Fifth Lumbar Vertebra, with Special Regard to Its Morphology in Infancy (Contributo alla conoscenza del vizio di assimilazione sacrale del 5° metamero lombare, con speciale riguardo alla sua morfologia nell'infanzia). *Chir. d. organi di movimento*, 1921, v, 503.

Lupo complains that in France there is a tendency to ignore the work previously done by Italian investigators with regard to the anomalies of the lumbar vertebrae, especially the work done by Putti, Serra, Bertolotti, Rossi, and Coleschi. Although in 1910 and 1912 Adams and Goldthwait in America resected the right transverse process in a case of sacralization of the fifth lumbar vertebra with sacro-iliac pain, it was Bertolotti who, in 1917, first described a clinical syndrome of vicious regional differentiation and classified ischiatic, lumbar, sciatic, ureteral, and other typical pains according to their origin.

The relationship of clinical symptoms and skeletal anomalies has shown that from the second decade of life sacralization of the fifth lumbar vertebra may set up a painful syndrome of a character which varies with the morphology of the anomaly. It is incorrect to speak of a painful syndrome in regard to the phenomenon in infancy, as it is well known that the subjective and objective syndrome is not established until the complete development of the bone. In Lupo's opinion, however, it would be of interest to make a careful search for any such malformations during the period of early extra-uterine development in order to confirm the beginning of the clinical syndrome and discover what conditions result from or are associated with regional heteromorphism.

The author reports eleven clinical cases of sacralization of the fifth lumbar vertebra in children under 16 years of age who had scoliosis, coxa vara, or some other deformity in addition. From these cases he draws the following conclusions:

1. Sacralization of the fifth lumbar vertebra is not more rare in infancy than in adult life.
2. The defect is more frequently bilateral than unilateral.

3. In the first and second decades it is very seldom accompanied by pain or nervous disturbances.

4. It is frequently associated with congenital deformities of the lower limbs and pelvis, such as congenital hip dislocation, coxa valga, coxa vara, etc.

Lupo believes that in sacralization there is a true and profound change in the morphology of the vertebra. From the vertebral body to the arches and the transverse processes all the elements have undergone a retrogressive transformation so that in cases of advanced sacralization the lumbar character of the fifth vertebra no longer persists.

The records of the Radiologic Institute at Turin (110 cases) show that in 72 per cent the anomaly was bilateral and in 28 per cent unilateral. In the earlier reports published unilaterality was almost constant. The preponderance of bilaterality has become evident only with more recent roentgenological research.

As far as is known the degree of sacralization found in infancy indicates the degree of the fully developed anomaly.

The hypothesis that sacralization is due to a faulty foetal position or amniotic compression is not supported by the facts. We must admit, however, that some other cause acts in the embryonic period to modify the osteogenetic activity. Lupo believes that sacralization of the fifth lumbar vertebra is in all probability a phenomenon of a regressive type as its presence is normal in certain anthropomorphic apes. Coxa valga, which is almost always associated with sacralization, may also be considered a phenomenon of atavism. Thus the problem appears to resolve itself into the question of the causes of atavistic regression. That such regression is connected with a pathologic cause is today admitted almost universally but thus cause has not yet been determined.

W. A. BRENNAN.

Peabody, C. W.: Secondary Foci of Tuberculosis in the Spine in Pott's Disease. *Ann. Surg.*, 1922, lxxv, 95.

Within a period of six months there came under the author's observation in one clinic four cases of secondary foci in Pott's disease. As this frequent

incidence is at variance with the prevailing opinion, an exhaustive search and analysis of the records of the X-ray department of the Massachusetts General Hospital was made. Both out-patient and ward cases from 1913 to date were investigated. The number of cases finally and definitely diagnosed as Pott's disease amounted to 315. In this series there were thirteen cases with secondary foci in the spine.

The author divides the series into two groups. For the cases of Group 1, those treated between 1913 and 1918, detailed reports of the X-ray findings were lacking, only a summary being given. For Group 2, those treated since 1918, the records are complete. Group 1 included 200 cases, four (2 per cent) with secondary foci. Group 2 included 112 cases, nine (8.2 per cent) with secondary foci. The total of Groups 1 and 2 equals 312 cases with thirteen (4.1 per cent) with secondary foci.

In Peabody's opinion the incidence of secondary foci in the second group is nearer the real incidence than that in the total number of cases and the highest rate given may be below the real incidence. His reasons are:

1. In almost all the cases the discovery of the secondary foci was accidental.

2. In a large number of the cases the plates included only a limited area of the spine.

3. In the majority of the cases one focus was more advanced than the other and gave clinical evidence of its presence. It is generally the custom to X-ray only the part which is clinically involved. Hence, unless the clinician demands an extensive examination, only a closely adjacent lesion will be discovered. Therefore a routine search for further lesions would probably show a higher incidence of secondary foci.

Peabody speculates as to the manner in which the process spreads—whether the lesions are separate hæmatogenous infections from a common distant source, whether the second lesion is caused by organisms thrown into the blood stream by the first lesion, and whether the new focus is a direct metastasis through the lymphatics. He believes there is evidence in favor of the third theory.

JOHN W. POWERS, M.D.

SURGERY OF THE NERVOUS SYSTEM

Heile, B.: A Review of Our Nerve Operations with Follow-Up Examinations (Rueckblick auf unsere Nervenoperationen mit Nachuntersuchungen). *Beitr. z. klin. Chir.*, 1921, cxiv, 639.

According to Stoffel, the exact apposition of individual nerve strands is generally impossible and if the apposition is only approximate it is without any very great value. This is shown by microscopic pictures which accompany the article; they demonstrate also the importance of the sympathetic fibers in the peripheral nerves, and prove that the interruption of peripheral nerves by indirect inflamma-

tory processes arising in remote wounds is more frequent than has been believed heretofore.

The author has entirely abandoned internal neurolysis as it yields a very small percentage of cures (12 per cent). As far as possible the sutured nerve must be placed in healthy surroundings. Isolation by means of calf arteries protects the nerve for a certain time only, and wrapping in fascia gives utterly bad results. Rubber drains give the best protection to the site of suture as they have been found still unattacked by granulations after five years.

The author's technique is now much more simple than at the beginning of the war. Instead of small incisions, specific adaptation, internal neurolysis, and atypical partial resection, he now prefers large incisions, careful handling of the nerves, and a simple transverse resection. The end-results, however, are not much better. Of 300 cases operated on, eighty-seven reported in 1917 immediately after the operation were subsequently re-examined. In a fourth of these cases there had been no improvement after thirty months, in three-fourths there was improvement, and in one-fourth of the latter a complete cure. Of the cases of diastasis only one was cured, a case in which a defect of the sciatic nerve at the level of the gluteal fold, 8 cm. long, was entirely healed within two years after the gap had been bridged with silk threads. Therefore the author has become convinced of the value of tendon transplantation in such cases.

The most favorable results from operation were shown by the radial nerve, the worst by the plexus. In mixed nerves the restoration of the motor strands always took place earlier than that of the sensory. It was often impossible to overcome the irritation of sensory nerves, attributed by the author to neuritis, even by section of the nerve. Hence in one case of sciatica he resected the fifth lumbar and the first three sacral roots, and in another case, the second and third sacral roots. The results were very satisfactory.

KEMPF (Z).

Lahey, F. H., and Clute, H. M.: Spinal Accessory Paralysis Following Neck Dissection. *Boston M. & S. J.*, 1922, clxxvi, 1.

Letters were sent to 132 patients who had had a dissection of the neck for tuberculous lymph nodes

at the Boston City Hospital. Of forty-six who replied, twelve had paralysis of the spinal accessory nerves. The loss of function was most marked by inability to abduct the arm beyond a right angle with any degree of power or to elevate the shoulders.

The relations of the spinal accessory nerve and the formation of the subtrapezius plexus are shown in three dissection plates. Photographs of seven patients are given.

In the authors' opinion the spinal accessory nerve is probably quite susceptible to the effects of trauma and its regenerative capacity following trauma is limited, particularly when the regeneration must occur while the nerve is still located in a field that is to be the site of considerable scar tissue.

For the identification of the nerve a battery with electrodes should be used; the nerve should never be pinched.

In conclusion the authors state that in undertaking neck operations for lesions not necessarily fatal the loss of function secondary to spinal accessory paralysis must always be considered of serious consequence. This complication is not always avoidable because it is sometimes practically impossible to preserve the nerve and remove the disease foci, and because interruption in conductivity may follow even when the nerve has been preserved.

To undertake neck dissections of the type under discussion the surgeon should familiarize himself thoroughly with the course and relation of the spinal accessory nerve and the second, third, fourth, and fifth cervical nerves, and should take great care to preserve them.

CARL R. STEINKE, M.D.

MISCELLANEOUS

CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

Renaud, A.: A Case of Primary Multiple Carcinoma (Un cas de carcinomes multiples primaires). *Rev. méd. de la Suisse Rom.*, 1921, xli, 773.

The author reports the case of a patient 77 years of age who had a lesion in the skin over the left frontoparietal area which was clinically diagnosed as a rodent ulcer. Over the right temporal region was a vegetative growth. The ulcerated lesion had developed gradually during a period of five or six years while the other lesion had appeared in three or four months, directly following the application of bichloride of mercury paste to an area of senile keratosis. Histologically the rodent ulcer showed a typical squamous-celled carcinoma with epithelial pearls, while the vegetative lesion showed a basal-celled carcinoma.

The fundamental histologic and clinical differences in these two lesions occurring in the same individual present a rare picture which cannot be

explained satisfactorily by any of the known theories regarding the development of carcinoma.

LOYAL E. DAVIS, M.D.

Kuijjer, J. H.: The Surgical Treatment of Tumors (Die operative Behandlung der Geschwulste). *Nederl. Tijdschr. v. Geneesk.*, 1921, lxxv, 2466.

The question whether a cancer should be treated by operation or by radiotherapy must be answered on the basis of its variety and location. Carcinomata of the skin, lips, vulva, or penis can be cured by operation or by radiotherapy. For carcinoma of the eyelid, ala nasi, or eyebrow, radiotherapy is to be preferred to operation. Inoperable tumors are best treated by radiotherapy. Metastatic lymph glands should be removed surgically. Rapidly growing carcinomata of the skin and mucous membrane should be treated by enucleation followed by radiotherapy.

Carcinoma of the tongue, the stomach, and the intestine demand radical removal. In cases of carcinoma of the rectum, gall-bladder, pancreas, uterus,

and breast, removal and radiotherapy are indicated. Carcinoma of the breast with necrosing and infiltrating growth should be treated by enucleation followed by radiotherapy; if there are multiple neoplasms, radiotherapy exclusively is indicated. Sarcomata are in general more difficult to operate upon than carcinomata and hence are treated preferably with the X-rays and radium; the same may be said of lymphogranulomata. The prognosis of melanosarcoma is unfavorable in all cases. DUNCKER (Z).

Robinson, C. A.: Notes on Twenty Cases of Ulcer of the Leg Treated by Electrical Methods. *Arch. Radiol. & Electrotherapy*, 1922, xxvi, 253.

The ulcers in the cases reviewed were what would be called varicose ulcers without the presence of varicose veins. In many of the cases scarring had deprived the ulcer of a proper vascular supply. The first indication in such cases are measures to increase the blood flow through the tissues by relieving the stasis and rendering the scar tissue more vascular. In the cases reported the direct current was used, the cathode being applied to the ulcer. By its action in rendering the secretion more fluid, the crusts and scabs are removed and a free discharge of pus is induced; probably also the capillaries are dilated or contracted, diapedesis is modified, the amoeboid movements of leucocytes are hastened, and phagocytosis is increased.

In applying the current the legs were placed in Schneecells connected with a direct current supply, the leg with the ulcer being placed in the cell attached to the negative pole. A current of 30 milliamperes was employed for thirty minutes. A large part of the current passes through the ulcer because of its lessened resistance, but a sufficient amount traverses the skin to cause a general hyperemia.

Of the twenty cases, four were definitely cured within two to eight weeks. Five are healing rapidly or were doing so when they were transferred to other institutions. In four cases the treatment failed. In the remainder the results were inconclusive as some had been under treatment only a few days, one developed an epithelioma necessitating amputation, and one patient was syphilitic. If only cures and failures are considered, 50 per cent were cured. All the cases were chronic and had been under other treatment for years.

O. S. PROCTOR, M.D.

BLOOD

Bull, P.: What Can More than 6,000 Postmortem Examinations Teach Us About Emboli and Embolic Gangrene of the Extremities? *Acta chirurg. Scand.*, 1922, liv, 315.

Embolus may come from: (1) a more or less central spot in the arterial system, especially the aorta, (2) the left side of the heart, (3) the pulmonary veins, (4) the right side of the heart, and (5) the systemic veins. The two last possibilities, however,

presuppose a patent foramen ovale through which the embolus may pass from the right atrium into the left and then into the general circulation, the so-called paradoxical embolism.

Bull demonstrated embolism of the extremities fifteen times. As regards the localization of the emboli and gangrene these fifteen cases may be grouped as follows:

Artery	Cases	With gangrene	Without gangrene	Doubtful
Aorta	2	1	1	
Common and external iliac	6	1	4	1
External iliac and femoral	1	1		
Hypogastric and deep femoral	1		1	
Superficial femoral	2		1	1
Femoral (?)	1	1		
Popliteal	1		1	
Subclavian and axillary	1	1		

The lower extremities were attacked in fourteen cases, the upper extremities in only one.

In thirteen of the fifteen cases the formation of thrombi in one or more of the cardiac cavities was demonstrated. In the two remaining cases the primary thrombosis was formed presumably in the aorta.

Among 6,140 sections, thrombosis of the aorta and heart was found in 243 cases, about 4 per cent of the total number.

Thrombic deposits on the valves were demonstrated in seventy-three of 6,140 postmortem examinations, and almost exclusively in the left side of the heart and associated with acute endocarditis.

In all the cases, embolism in one or more organs could be shown. In fourteen there were thirty emboli in other organs in addition to the embolus in the artery of the extremity. These were distributed as follows: lungs, nine; kidneys, nine; spleen, seven; brain, four; intestines, one.

From this it appears that in cases of embolism in the extremities attention should be directed toward embolism in other organs, especially the lungs where they are present because thrombotic formations appear at the same time in both halves of the heart.

MORRIS H. KAHN, M.D.

BLOOD AND LYMPH VESSELS

Neff, J. M.: Blood-Vessel Suture. *Surg., Gynec. & Obst.*, 1921, xxxiii, 657.

The indications for blood vessel surgery are:

1. A break in the continuity of a blood vessel due to an external cause such as a gunshot or stab wound, or to an internal cause such as a fracture, dislocation, or traction exerted in an attempt to reduce a dislocation or straighten a limb that has been in the flexed position for a prolonged period of time.

2. Resection of a vessel in a surgical operation such as the removal of a growth involving an artery

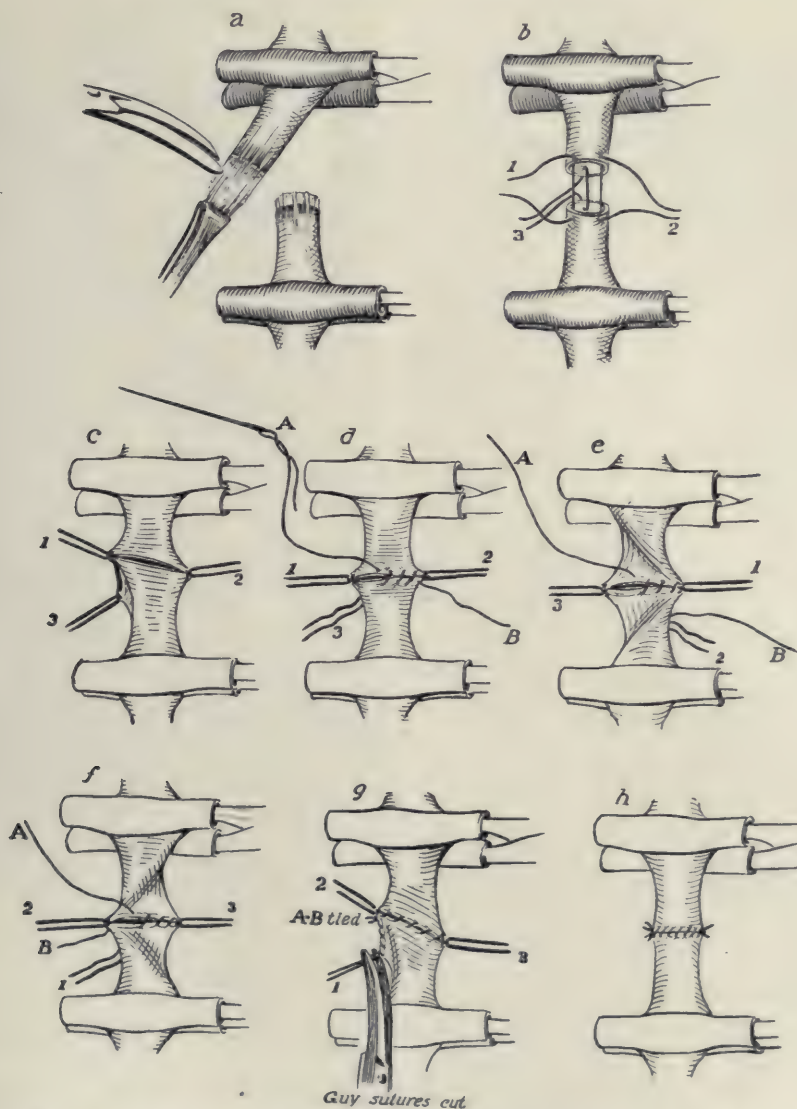


Fig. A. The clamps are in place on the vessel and the adventitia is being drawn over the end of the vessel and about to be cut off by the scissors.

Fig. B. The three guy rope sutures equidistant from each other are in place, having been passed through all coats of the vessel. Guy ropes 1, 2 and 3.

Fig. C. Guy ropes 1, 2, and 3 are tied, traction is being made on them, and the circular circumference of the artery is converted into a triangle.

Fig. D. The continuous silk suture has been begun at 2, and is uniting the edges, passing through all the coats.

Fig. E. Traction is now being made on Guy ropes 1 and 3, twisting the vessel through one-third of its circumference. The same continuous suture, B, is shown passing through all coats of the vessel.

Fig. F. The continuous suture, B, has passed Guy rope 3, traction is being made on 2 and 3, after 3 has been passed beneath the vessel. Traction on 2 and 3 now twists the vessel through another one-third of its circumference, but in the opposite direction.

Fig. G. The continuous suture around the vessel is now complete

Fig. H. The guy ropes and continuous sutures have been cut and the end-to-end anastomosis is complete.

or vein or both or the accidental injury of a vessel during the course of an operation, as in the removal of enlarged glands or new growths from the neck, axilla, or groin. The femoral artery and vein have frequently been injured during hernia operations, either by passing the needle through them or through the deep epigastric artery at its origin.

3. Arteriovenous anastomosis in cases of embolism and thrombosis of the lower extremities, Reynaud's disease, senile gangrene, etc.

Success in vascular suture demands absolute asepsis, the absence of tension between the united segments of the artery or vein, and the avoidance of injury to the intima. The exposed ends of the vessels must be kept moist with warm normal salt solution throughout the operation and care must be taken to prevent the adventitia from coming between the injured ends of the vessel.

The contra-indications to operation upon a blood vessel are: (1) sepsis, (2) any considerable degree of tension between the ends of the vessel, (3) a poor general condition of the patient rendering him unable to stand the rather prolonged operation of vessel suture, (4) irreparable injury of the vessel, (5) inaccessibility of the injury making suture impossible, and (6) a marked degree of arteriosclerosis.

The author describes in detail the method of Carrel which he considers the best of all. This method is shown in the accompanying figures.

FREDERICK CHRISTOPHER, M.D.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Schmieden, V., and Peiper, H.: **Experiences with the Fischer-Bruening Operative Reduction of the Adrenal Glands in the Treatment of Convulsions** (Unsere Erfahrungen mit der operativen Nebennierenreduktion nach Fischer-Bruening zur Behandlung von Kraempfen). *Arch. f. klin. Chir.*, 1921, cxviii, 845.

The authors discuss the theory of Fischer, according to which the common and most important symptom of the etiologically different diseases to which the term "epilepsy" is applied is an increased predisposition to convulsions. The convulsive mechanism can be incited to action through various points of attack. One point is the brain, and another, the adrenal cortex. Both are connected by the sympathetic nerves.

On the basis of these facts, Bruening claims to have favorably influenced not only the genuine but also traumatic epilepsy by reduction of the adrenal tissue or the extirpation of one adrenal gland. In traumatic epilepsy this operation is indicated only after failure of the cerebral operation.

In the Frankfort clinic seven cases of epilepsy due to various causes (the genuine form, epilepsy due to foetal encephalitis or cerebral infantile paralysis) and in patients of various ages (from 6 to 23 years) and of both sexes were treated by transperitoneal extirpation of the left adrenal gland. In the case due to cerebral infantile paralysis, that of a boy 14 years of age, a superficial cerebral cyst with thick connective tissue walls, cicatricial changes of the brain substance, and chronic œdema of the cerebral meninges was emptied in another clinic nine months before the extirpation of the adrenal gland. After these operations the authors observed a more or less distinct lessening or disappearance of the convulsions. This continued for five days to five weeks, but the old condition then returned. In two cases, including the case with the cerebral and adrenal operation, the convulsions became more severe in spite of the continuous administration of luminal. Nevertheless, the authors do not wish to draw from their failures conclusions against the operation or against Fischer's theory as they believe that a compensatory hypertrophy of the remaining adrenal gland is possible. The extirpated adrenals, however, showed normal weight and no changes in the finer structure of the cortex which would suggest a disturbance of function.

The postoperative changes of other organs, particularly of the endocrine glands, and the effects upon the female sexual glands are also discussed. The authors observed once a transient amenorrhœa after the operation in a case in which previously menstruation had been regular, and in another case a return of the menses after their absence for eight years. In a sexually precocious 16-year-old epileptic there was a distinct diminution of the libido, but this lasted for only a few weeks. The effect of practical importance exerted by extirpation of the adrenal gland upon the pancreas was a decrease in the blood sugar to half. Marked differences in the blood pressure before and after the operation were not observed.

The blood picture showed a postoperative change in the sense of a percentage variation in the leucocytes (for example, an increase of the polymorphonuclear neutrophils from 9,000 to 40,000, and a decrease of the lymphocytes from 37 to 10 per cent). With regard to disturbances during the operation, the authors noted twice a brief arrest of breathing.

In conclusion a case is cited in which Seiffert extirpated the left adrenal gland which was cystically distended and as large as a hen's egg. Five months after the operation the patient was free from subjective symptoms during the intervals between attacks and the attacks themselves had become less frequent and less severe.

KEMPF (Z).

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Cannon, W. B.: Studies in Experimental Traumatic Shock. IV. Evidence of a Toxic Factor in Wound Shock. *Arch. Surg.*, 1922, iv, 1.

Wound shock is characterized by a low venous pressure, a rapid thready pulse, a decrease in the blood volume, a normal or increased erythrocyte count and hæmoglobin percentage in the peripheral blood, a leucocytosis, an increase in the blood nitrogen, a decrease in the blood alkali, a lowered metabolism, a subnormal temperature, a cold skin which is moist with sweat, a pallid, grayish, or slightly cyanotic appearance, thirst, rapid respiration, and often by vomiting, restlessness, and anxiety changing to mental dullness and lessened sensitivity.

The injection into the anesthetized animal of extremely minute amounts of histamin, a substance derived from the amino-acid histidin by the removal of carbon dioxide, causes changes resembling those of shock, the blood leaving the arteries and veins and being concentrated in capillary areas. The action of histamin typifies the action of the toxic substances derived from protein material—products of partial digestion, of bacterial action, and of tissue extraction.

Secondary shock is a traumatic toxæmia, and not of the nature of a nervous effect. It is characteristically observed in association with extensive damage of muscles or multiple wounds scattered over the body. Whatever favors absorption at the region of injury is favorable to the development of shock, and whatever delays or checks absorption from the injured region delays the development of shock. Suppression of the injured region, if not too long delayed, causes the disappearance of shock.

The present conception seems to be that not only the shock following burns, but also the delayed shock following severe trauma is properly placed in the same category with other forms of general depression of bodily function and defective circulation due to the setting free of toxic material in the body.

MORRIS H. KAHN, M.D.

Crile, G. W.: Studies in Exhaustion: III. Emotion. *Arch. Surg.*, 1922, iv, 130.

Intense emotion, especially fear, is one of the most injurious of human experiences. The fear of hunted animals is similar in its effect.

Experiments were carried on with rabbits which for varying periods of time were threatened by muzzled dogs. In some instances the frightened animals were killed at once; in others, varying periods of time were allowed to elapse before they were killed in order that the later effects of the emotion might be studied; in still other cases the animals were subjected to daily periods of fright for several successive days.

Differential Purkinje cell counts were made from the rabbits in each of these groups, and tests were made of the effect of fright on the adrenal output,

the hydrogen-ion concentration of the blood, and the basal metabolism.

Extreme emotion caused demonstrable histologic lesions in the central nervous system, the liver, and the adrenals. The brain cells showed increased activity manifested by hyperchromatism followed by a progressive chromatolysis. In cats, fear caused glycosuria, albumin and casts in the urine, a decrease in the metabolism (after the period of fear), changes in the iodine content of the thyroid, and increased hydrogen-ion concentration of the blood.

Clinically, extreme emotion raises the body temperature, increases the respiratory and pulse rate and, if sufficiently intense and prolonged, produces complete prostration which may prove fatal.

This research has shown that emotion drives the organism with extreme intensity; that, like trauma or exertion, it may drive it within the limits of normal response or so overwhelmingly as to suspend the normal functions and reduce the individual to a state of complete cold prostration. In other words, emotion may cause exhaustion; it may cause shock.

The paper is splendidly and instructively illustrated.

MORRIS H. KAHN, M.D.

Lee, F. C.: The Establishment of Collateral Circulation Following Ligation of the Thoracic Duct. *Bull. Johns Hopkins Hosp.*, 1922, xxxiii, 21.

After reviewing the literature on the experimental ligation of the thoracic duct, the author describes an intrathoracic method for the complete ligation of the duct in the cat. Apparently the integrity of the thoracic duct is not essential to the life of the animal.

In some cases in which the ligation was absolute, collateral lymph circulation was established to the right thoracic duct, while in other cases which showed complete ligation, lymphaticovenous connections were found between the thoracic duct and the azygos vein.

These findings, which have a bearing also on fat absorption as well as on the clinical aspect of injuries to the thoracic duct, may be explained partly but not entirely by the embryology of the lymphatic system.

SAMUEL KAHN, M.D.

Baetzner, W.: Experimental Free Transplantation of Periosteum (Ueber experimentelle freie Periostverpflanzung). *Arch. f. klin. Chir.*, 1921, cxviii, 504.

In experiments on dogs an attempt was made to determine whether small fragments of periosteum completely separated from bones and periosteum and transplanted into the soft parts are capable of forming bone. Periosteum removed from the anterior crest of the tibia was buried in a muscle belly. The earliest removal occurred after four weeks and the latest after six months.

In the first series of experiments in which fifty-seven transplantations were done no bone was found

in a single case. In a large majority of the cases, and especially in the cases of later removal, the periosteum had been entirely absorbed and the area of implantation was indicated only by very slight retraction or a fine whitish scar in the musculature.

The second series of experiments on young dogs consisted of sixteen transplantations. In six cases complete absorption occurred again. In the others, larger flattened inlays were found in the musculature. In only one case was there a pea-sized piece of bone and in this instance the histologic structure of the bone suggested that it had been transplanted with the periosteum.

In view of the findings in both of these series of experiments it seems evident that free transplants of small pieces of periosteum cannot form permanent bone in adult or adolescent dogs. VALENTIN (Z).

Bryant, J.: Visceral Adhesions and Bands: Normal Incidence. *Am. J. M. Sc.*, 1922, clxiii, 75.

The material on which this paper is based was obtained before the world war in the collection of the data of a much more comprehensive investigation regarding the etiology and treatment of chronic intestinal pathology. It consisted of a series of over one thousand observations in 297 consecutive autopsies on bodies of all ages and both sexes, the only cases excluded being those few recently operated upon and those exhibiting recent frank peritonitis. The adhesions or bands present showed a most interesting uniformity as regards percentage frequency in both sexes, not only in the foetus but also in the bodies of older persons. The order of frequency of the seven most common adhesions is shown in a table as follows:

ADHESIONS OR BANDS	Males	Females
	Per cent	Per cent
Gall-bladder to the duodenum and the transverse colon.....	25.6	24.8
Gall-bladder to the transverse colon....	17.2	9.4
Gall-bladder to the duodenum.....	15.5	17.9
Appendix to the peritoneum.....	15.0	5.9
Omentum to the ascending and the transverse colon.....	11.1	12.0
Ascending colon to the transverse colon..	10.6	5.9
Duodenum to the peritoneum.....	6.7	10.3

A consideration of the adhesions from the standpoint of the individual organs involved at varying ages and in both sexes is reserved for a later publication.

As a result of the study of these cases Bryant arrives at the following conclusions:

1. The frequency of adhesions or bands in the foetus of both sexes has been greatly underestimated. Of a group of thirty-four fetuses of both sexes only 5.9 per cent were free from demonstrable adhesions or bands. All of the eighteen male fetuses showed such variations from the normal.

2. The adhesions present in the foetus are less varied in number and of a definitely less complex type than those found in later life.

3. The age of 40 is critical in both sexes. Up to this age there is practically no increase in frequency above the foetal rate of involvement for the different viscera. Beyond the age of 40 there is a sudden increase of about 50 per cent in both sexes, the increase being somewhat more marked in the female than in the male.

4. The two adhesions or bands found most often in both sexes at all ages are, in the order of their frequency: (1) gall-bladder to the duodenum and the transverse colon; (2) gall-bladder to the transverse colon. It would appear therefore that these adhesions or bands are of congenital or developmental origin.

5. The regions or quadrants of the abdomen most frequently involved by adhesions or bands in both sexes are, in the order of frequency of involvement, as follows: the right upper quadrant, the right lower quadrant, the left upper quadrant, and the left lower quadrant.

E. C. ROBITSHEK, M.D.

ROENTGENOLOGY AND RADIUM THERAPY

Edeiken, L.: An Unsuspected Dermoid Cyst Diagnosed by Roentgen Examination. *Am. J. Roentgenol.*, 1922, n. s. ix, 15.

This is the report of a case in which a dermoid cyst was discovered in the course of a roentgen examination for ureteral stone. A number of undeveloped teeth embedded in a matrix of bone were seen in the roentgenogram. The diagnosis was confirmed by operation.

ADOLPH HARTUNG, M.D.

Keith, D. Y., and Keith, J. P.: Three Cases of Sarcoma Treated by Radiation. *Am. J. Roentgenol.*, 1922, n. s. ix, 31.

Two of the three cases reported in detail were cases of melanosisarcoma which had been operated upon repeatedly. Following roentgen therapy the condition in both cleared up and the patients have remained well and free from recurrence to date, one for five years and the other for two. In order to obtain lethal doses within the tumor, more than erythema doses of filtered rays were given by the crossfire method. After all evidences of the growth had disappeared prophylactic doses were given at intervals.

The third case was diagnosed as sarcoma and regarded as inoperable. The growth, which was about the size of an orange, was situated in the upper part of the mammary gland and extended outward into the pectoral muscle. There was marked enlargement of the axillary glands. After repeated doses of roentgen rays producing a severe skin reaction the growth receded and about ten months after the beginning of the treatment the patient was completely free from enlargement in the pectoral muscle. At the time this article was written a symptomatic cure had persisted for one year.

ADOLPH HARTUNG, M.D.

Van Zwaluwenburg, J. G.: *The X-Ray Diagnosis of Accessory Sinusitis*. *Am. J. Roentgenol.*, 1922, n. s. ix, 1.

In order to clear up some of the confusion relative to the value of the roentgen examination in inflammation of the nasal accessory sinuses, the author reviews the subject in general, endeavors to extend the application of the method by urging the adoption of a simpler but more comprehensive technique, and gives a detailed description of the findings on which he bases his interpretation. With regard to the technique he states that for accurate judgment the structures of the nose and all the sinuses must be demonstrated at a single routine examination, the symmetrical parts must be compared, and, since the confusing shadows of the structures of the base of the skull and the cervical spine cannot be obviated by any one position or projection, there must be sufficient differentiation of these structures to permit the recognition and separate evaluation of their shadows.

The author believes these requirements are met by stereoscopic exposures in a sagittal projection with the forehead in contact with the plate changer and the direction of the shift cephalad. Special stress is laid upon the use of a very fine focus tube as everything depends upon the fineness of detail in the posterior portion of the field.

Satisfactory plates should show clearly and in good stereoscopic vision the lateral processes of the atlas and axis and the tip of the odontoid process. The latter should lie in the midline and should not reach above the lower third of the septum of the nose. It is necessary to recognize clearly the structures of the upper nasal passages as well. In interpretation, greater dependence is to be placed upon the changes in the bony structures than on the hazy opacities caused by the exudates and the soft-tissue changes.

Considerable space is given to a consideration of the pathology of sinus infection in order to correlate the roentgen findings with such changes. Special emphasis is laid upon structural changes within the nose for upon these the tendency to chronicity is largely dependent. The roentgen interpretation must include a close study of those structures. Bone changes in the bony septa and walls of the sinuses are osteoplastic or osteoporotic, depending upon whether the condition is frankly purulent or tends to the hypertrophic type or so-called "polypoid disease."

A frequent observation and one that appears to the author to be of first importance is the relatively small size of the chronically diseased sinus. This feature is always well marked in the juvenile cases, and when it is found in the adult a history of long-standing disease dating back to childhood may be elicited almost invariably. It is clearly the result of the inhibitory influence of the inflammatory process on the normal growth and development of the pneumatic structures. The result is frequently a high degree of asymmetry.

Regarding the findings in acute purulent sinusitis the author states that the only changes that can be anticipated in the roentgenographic picture represent the shadows of the oedema and exudates in the sinuses replacing the air usually found there. In exceptional cases the diffuse shadow of what is apparently the exudate of an acute infection is conspicuous and unmistakable. A negative diagnosis, however, is extremely hazardous. Sometimes the upright position and the horizontally directed ray will demonstrate a horizontal fluid level in the antrum. Acute polypoid disease occurs infrequently and invariably escapes detection in the roentgen examination.

The signs of chronic purulent sinus infection are precisely those of an osteoplastic process in the corresponding chambers and the contiguous portions of the nose and frontal bone. The increase in the density of the shadows appears to be due largely to the increased thickness of the walls of the sinuses. The contents of these chambers play little part in the total density. The diffuse haziness that fills this region is due apparently to the thickening of the anterior and posterior walls rather than to the presence of retained secretions, except in the larger cavities of the maxillary sinus in which the contribution of the latter may be appreciable.

While solitary infections occur, they are not so common as is commonly supposed; group infections are the rule. The association of the posterior ethmoid infections with infection of the maxillary sinus is so constant that its failure strongly suggests that the origin of the maxillary sinusitis is in some dental pathology. Necrosis of the bone and osteomyelitis occur as an extension of the process in the frontal sinuses, but the rest of the bony structures appear to be too thin to favor such a process elsewhere.

In the ethmoidal group the general opacity is not so striking because of the smaller area of bone and the smaller cubical capacity of the walls involved. The increase of density is usually easily appreciated by comparison with the opposite cells in comparable positions, and the changes which involve the middle turbinate confirm the diagnosis. Solitary infections of the ethmoids are uncommon and are most frequently found in the most posterior and external ethmoid cells. The frontal sinus often shows a considerable zone of increased density in the frontal bone about the cavity of the cells, and the thickening of the anterior wall is usually sufficient to cast an appreciable shadow. The main reliance for diagnosis must rest on the condition of the infundibulum which invariably shows distinct changes. The infundibular walls are early thickened and the cavity is obscured. The irregular members of the anterior ethmoid-cell group which lie in immediate relationship to the infundibulum regularly show simultaneous involvement.

The sphenoid is readily recognized by the use of stereoscopic plates and when infected shows increased thickness of its walls and much added

general density. In exceptional cases the entire structure is represented by a uniform opacity in which differentiation between the wall and contents is impossible. The distinction between a sphenoiditis and an intranasal opacity due to conditions such as polypoid disease may be extremely difficult. The septum of the sphenoid is rarely made out because of its obliquity but occasionally may be seen. Unilateral sphenoiditis presumably occurs but has not been recognized by the author. An early extension to the other cell appears to be the rule.

The differential diagnosis must take into consideration the rare cases of failure of aeration of the accessory sinuses and the persistence of cancellous bone throughout life. The latter is seen most frequently in the maxillary sinus and presents a very confusing picture. Usually it may be recognized by the uniform distribution of its shadows, the smaller size of the maxillary sinus on the affected side, with resulting asymmetry, and the absence of a definite cortical layer on both sides of the relatively thin wall of the normal antrum.

The roentgenological appearance of chronic polypoid disease of the accessory sinuses is in marked contrast to the purulent type described. The main features of the picture are due to the osteoporosis of the bony walls and the exclusion of air caused by the overgrowth of the mucous membrane. In the roentgenogram this destroys to a large degree all the differentiating contrasts and details of the normal sinus cavities. The polypoid process involves the cells and their cavities and completely fills the upper nasal passages with hypertrophied and polypoid mucosa, entirely closing the upper and middle meati. By contrast, the excessive width of the lower nasal fossa due to the atrophy of the bony and soft tissue elements of the lower turbinates is accentuated. The result is a diffuse, hazy plate almost entirely lacking differentiation and showing only the more massive and conspicuous structures of the nose. The process varies considerably in degree in different cases, apparently with the chronicity of the disease. It is usually bilateral and symmetrical and rarely can one say with conviction that any one of the sinuses has escaped involvement. The major process is apparently always in the ethmoid region.

Fundamentally, such changes in density as have been described with regard to the purulent and the polypoid types of disease represent only the structural changes that have occurred in the bones of the skull. These require time for their development and result from infections of considerable chronicity. They do not regularly follow an acute sinusitis or repeated attacks of acute sinusitis of short duration. The roentgenogram of the sinus susceptible to recurrent attacks is quite as apt to show no appreciable changes during the free intervals. The changes are in the nature of scars and may be expected to persist after the process which induced them has ceased. It is therefore entirely conceivable

that the sinuses in question in which definite changes have been demonstrated are entirely free from infection at the time they are examined. The sinuses so recognized are therefore anatomically, if not actually, inflamed and deserve exactly the same consideration and treatment by the surgeon as those involved by a purulent process.

ADOLPH HARTUNG, M.D.

Pfahler, G. E.: The Treatment of Carcinoma of the Thyroid by the Roentgen Rays and Radium.
Am. J. Roentgenol., 1922, n. s. ix, 20.

The author has been unable to find in the literature any record of cases of carcinoma of the thyroid treated by radiotherapy. His experiences have extended over a period of eleven years, and his results have been generally most gratifying even though nearly all of the cases were regarded as hopeless.

The histories of ten cases are reported in detail. Practically all of the patients received some benefit. One of them is alive and well two years after the treatment; two others, three years; one, four years; one, seven years; and one, eight years. In most of the cases the diagnosis was confirmed by previous operation and pathologic section.

On the basis of his experience the author recommends the following technique:

Three or more portals of entry should be chosen, according to the amount and distribution of the disease. A focal skin distance of 30 cm., a 9-in. parallel spark gap, 5 ma. of current, 6 mm. of filter, and an exposure of twenty minutes should be used. The treatments should be repeated over each area at intervals of a week if possible, and each area should be treated three times. The treatment should then be stopped completely for three or four weeks. At the end of that time each area may be covered again twice in a similar manner. If the disease localizes itself to a single nodular mass which ceases to respond to further treatment, it is entirely practical to introduce radium needles directly into the tumor tissue and thus bring about a more thorough destruction of the cancer cells in the deeper portions. Ten milligrams of radium element in the form of needles can be introduced into the tumor tissue approximately 1 cm. apart and left in place six to eight hours, or 2 cm. apart and left in place twelve to fifteen hours.

The author draws the following conclusions:

1. Every case of carcinoma of the thyroid that has been operated upon should be given, as soon as possible, at least two thorough courses of roentgen-ray treatment, and more if the disease has not been completely removed so far as the surgeon can recognize it.

2. If a diagnosis of carcinoma of the thyroid can be made without operation there is reasonably good hope of success from radiation treatment.

3. Recurrent cases can be made to respond to treatment and the recurrence can be made to

disappear, but definite metastases in late cases are not apt to be controlled.

4. Radium may be combined with roentgen-ray treatment to good advantage in carcinoma of the thyroid when the tumor has become definitely localized and when it ceases to respond to the roentgen rays.

ADOLPH HARTUNG, M.D.

Carman, R. D.: Benign and Malignant Gastric Ulcers from a Roentgenological Viewpoint.
Am. J. Roentgenol., 1922, n.s. viii, 695.

Although the roentgenological distinction between typical cancer and typical ulcer is manifestly not difficult, the roentgen-ray examination does not always determine the benignancy or malignancy of a given ulcerous lesion. Between the classic tumor and the classic ulcer are innumerable gradations according to the predominance of one or the other feature. The ulcerous lesions are reported by the roentgenologist as ulcers because the characteristic niche-deformity is within the wall of the stomach. When exposed at operation, they generally have the macroscopic appearance of benign ulcer, but microscopic examination of the tissue sometimes reveals cancer.

Ulcers with microscopic evidence of cancer fall into two groups: (1) ulcers in which both the floor and the border of the lesion contain cancerous tissue in abundance; (2) ulcers in which cancerous tissue is found in the margin but not in the floor. The second type has given rise to an extensive literature on the question of the development of cancer on ulcer. Opinions vary from that of Hirschfeld, who denied any relation between cancer and ulcer, to that of Zenker, who maintained that most cancers develop on ulcers. Mayo, Kuttner, Payr, Aschoff, and Henke all agree that in these cases a diagnosis of cancer is impossible from the macroscopic examination alone and that the presence of malignancy can be definitely established or excluded only by microscopic examination.

In the roentgen-ray laboratory of the Mayo Clinic, well-defined, ulcerous gastric lesions of the niche-type are reported as "ulcer" because the gross characteristics are those of ulcer and the clinicians and surgeons realize that the roentgenologist cannot determine whether the histologic picture is benign or malignant. Gastric filling defects with palpable tumor are reported as "cancer" because experience has shown that 95 per cent of such tumors are cancers and the empirical element in the diagnosis is thoroughly comprehended by all concerned.

Some ulcerating cancers have gross characteristics of both cancer and ulcer. When a cancer has undergone deep ulcerous excavation and the ulcer is surrounded by a wall-like overhanging margin, fluoroscopic examination with palpation may reveal peculiarities recently described by the author and considered by him to be pathognomonic (Fig. 1).

If such a lesion is on the posterior wall near the lesser curvature or on the vertical portion of the



Fig. 1. The demonstration of the lesion by palpation during roentgenoscopy.

lesser curvature, approximation of the stomach walls by palpation causes the crater of the ulcer to appear as a dark shadow resembling a meniscus as seen in profile (Fig. 2). Its convexity is directed outward toward the gastric wall, and its concavity toward the gastric lumen. When the ulcer saddles the lesser curvature of a fishhook stomach distal to the incisura angularis the floor of the ulcer bends with the lesser curvature and its concavity is directed outward. If the ulcer is high in the stomach on the posterior wall, well away from the curvature, thinning of the barium by manual pressure reveals the crater as a rounded dense shadow encircled by a lighter zone, but no crescent is seen as in the edge-wise view (Fig. 3). When the patient is turned to the lateral view and the stomach is palpated the meniscus-like appearance of the crater may sometimes be obtained. Modifications of this sign may result from variations of the pathologic condition or the situation of the lesion. The manner of palpation and the degree of pressure exercised also affect the outline of the visualized crater so that it may appear rectangular or biconcave. The visualized crater in this type of ulcer differs from the classic niche-type ulcer in three particulars: (1) the crater is not within the wall of the stomach and therefore does not project from the visualized gastric lumen; (2) in profile the crater appears as a meniscus; and (3) it tends to retain its barium content during the palpatory manœuvres and is not easily emptied.

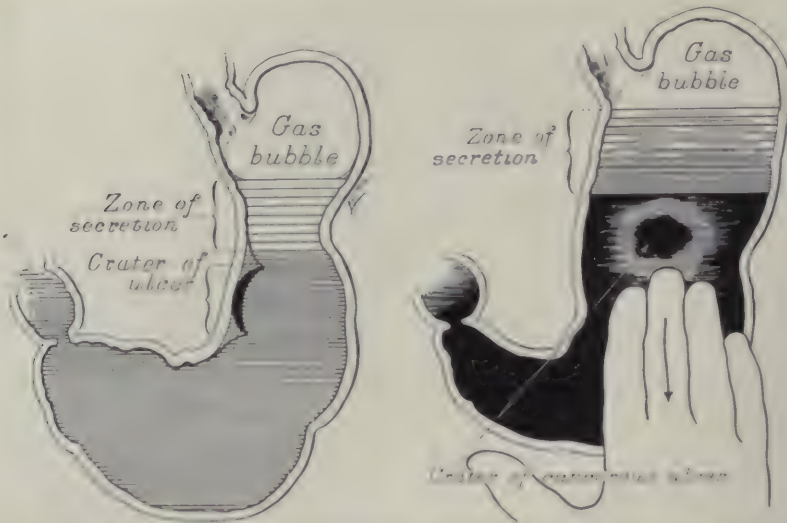


Fig. 2. The meniscus-like appearance of the crater seen in profile. Ulcer on the posterior wall near the lesser curvature.

Fig. 3. Ulcerating cancer of the posterior wall. The appearance of the crater on palpation at roentgenoscopy.

(*Benign and Malignant Gastric Ulcers from a Roentgenological Viewpoint—Carman.*)

The niche type of ulcer produces virtually the same roentgenological manifestations whether it is benign or malignant. When the niche representing the crater is 2.5 cm. or more in diameter, cancer is usually found in the ulcer on microscopic examination. Perforating ulcers producing an accessory pocket, however large they may be, are seldom malignant.

Cancers not mechanically obstructive are commonly associated with achylia and a gaping pylorus, while benign ulcers, even though distant from the pylorus, are apt to be accompanied by hyperacidity, spasticity of the pylorus, and six-hour retention. Such findings are not constant and only slight weight can be attached to them.

Alterations of peristalsis are of trifling differential significance; a gross malignant ulcer is oftener associated with anacidity and peristaltic sluggishness, and a simple ulcer with hyperacidity and peristaltic vigor, but the reverse also may be true.

G. H. JACKSON, JR., M.D.

Case, J. T.: A Review of Three Years' Work and Articles on Pneumoperitoneum. *Am. J. Roentgenol.*, 1922, n.s. viii, 714.

In an effort to sum up the present status of artificial pneumoperitoneum as a diagnostic aid the author gathered data from every available American source, including information obtained from circular letters of inquiry sent to 223 roentgenologists. The dangers, inconveniences, and contra-indications of the method as well as its field of usefulness were considered, and special inquiry was made concerning the safety of this measure as

an office diagnostic procedure. There seemed to be general agreement that the method must be pursued with due regard to the necessities of an aseptic surgical operation, excluding from the examination such cardiac or respiratory cases as would ordinarily be considered poor surgical risks; that the gas used should be carbon dioxide or a mixture of carbon dioxide and oxygen; that the amount of gas introduced should be carefully estimated; that the injection should be done slowly, while the patient is carefully observed for signs of untoward effect.

Among the inconveniences encountered, distress, either real or psychic, or anxiety on the part of the patient occupied a prominent place. Pain, nausea, vomiting, dyspnea, or profuse sweating were experienced by many patients, either singly or in combination, and none of the patients thus examined recalled the experience as pleasant. The discomfort was very much more marked when massive inflation was used than when only small amounts of gas were introduced. The method is time-consuming and the cause of considerable inconvenience in the roentgen laboratory. Aside from the distress, some of the inconveniences enumerated were due seemingly to errors in technique which might have been avoided. Thus, the production of an interstitial emphysema or sudden overdistention can be obviated, and persistent overdistention may be relieved by deflation or by the use of carbon dioxide in place of oxygen.

Dangers which have been enumerated include the following: intestinal puncture; puncture of an omental or mesenteric blood vessel; puncture of a

dilated ureter, the bladder, or some other abdominal viscus; peritonitis; air embolism; superficial emphysema; rupture of malignant adhesions; and precipitation of cardiac failure through overdistention of the abdomen. Detailed accounts of instances of each of these are given.

Four deaths directly associated with pneumoperitoneum have come to the author's notice. One was due to the introduction of oxygen into the spleen, and another to peritonitis. In the two other cases there was some difference of opinion as to the exact cause, though both deaths were undeniably associated with an attempt to examine by the pneumoperitoneum method. Particulars relative to all four of these cases are included.

The reported fatalities incontestably mark the procedure of artificial pneumoperitoneum as one which should be performed only in an institution fully equipped for surgical operations and emergencies, and by men ready to assume at once the responsibility of dealing with such emergencies if they arise. Undoubtedly some of the accidents reported were the result of errors in technique; yet those errors occurred in some of the foremost medical and surgical clinics of the world, in the hands of men recognized as able to avoid such errors if indeed it is possible always to avoid them. It may therefore be assumed that such errors are apt to recur from time to time in spite of all foresight and precaution.

As regards the indications for the use of pneumoperitoneum, Case states that, generally speaking, it is applicable in a selected class of cases of obscure abdominal or retroperitoneal conditions in which the careful use of all other clinical means has failed to elucidate the problem with any degree of satisfaction and where an exploratory operation does not seem preferable. Such conditions relate especially to lesions of the diaphragm other than subphrenic abscess, and obscure retroperitoneal lesions. Certain lesions of the kidney and their differentiation from paravertebral masses are especially well illuminated by this method, but the opinion is frequently offered that where the method has been used in urological work it has only occasionally added to the data already secured by other roentgenological or urological diagnostic means. The perfecting of the Potter-Bucky diaphragm has been one of the most important factors in still further narrowing the field of usefulness of pneumoperitoneum, as good roentgenograms made with the Potter-Bucky diaphragm show a wealth of detail surpassed only by plates made after gas inflation of the abdomen. Many laboratories have adopted the plan of trying the Potter-Bucky diaphragm technique before resorting to pneumoperitoneum. The result has been that frequently the latter is not needed.

Abdominal ascites presents the least contested indication for the introduction of gas, which is easily and safely carried out in this type of case. The method is probably next most useful to the gynecologist, especially when minimal amounts of

gas are introduced by transuterine insufflation. Adhesions of the intestines to the abdominal wall are sometimes most strikingly demonstrated by pneumoperitoneum. ADOLPH HARTUNG, M.D.

Mallet, L., and Coliez, R.: *The Value of Pneumoperitoneum in X-Ray Diagnosis* (Le pneumopéritoine en radio-diagnostic). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 1371.

This report is based on a study of 144 cases. The authors do not inject the gas under pressure directly into the abdominal cavity but use a method similar to that of Forlanini for artificial pneumothorax and the apparatus and trocar devised by Kuss. The site of choice for the puncture is in the left side of the great rectus muscle, slightly above and to the left of the umbilicus and the left iliac fossa, the patient being in right lateral decubitus. The puncture of the skin is made very obliquely, while that of the transverse fascia to the peritoneum is vertical. Ten cubic centimeters of water are first injected and then 2 liters of oxygen or carbon dioxide or a mixture of both. The authors prefer the mixture because it is absorbed more slowly. The patient is examined in dorsal, abdominal, and right lateral decubitus and in any other position that may be necessary. The kidneys and liver are excellently outlined; the gall-bladder is visible in about half the cases; the spleen can be seen clearly in ventral decubitus and by rotating the patient. For the examination of the pelvic organs the patient is put in the Trendelenburg or genupectoral position in order to free the pelvis from the intestines. In none of the 144 cases reviewed was there any accident.

In discussing this report Proust stated that in view of the fact that deaths have occurred after pneumoperitoneum, the method should be used only when the patient can remain in bed for twenty-four hours after the injection. It is contra-indicated in the cases of cachectic and anæmic patients and those with cardiac weakness, respiratory complications, acute salpingitis, appendicitis, or any other pathologic condition of the abdominal organs.

W. A. BRENNAN.

Newcomet, W. S.: *The Superficial Reaction of Radium as a Guide to Dosage*. *Am. J. Roentgenol.*, 1922, n. s. ix, 34.

The effects of radium upon the tissues depend upon the following conditions: (1) the amount of radium element or its equivalent that is used, (2) the distribution of the radiating material, (3) the time of application, its duration, and the intervals at which treatment is given, (4) the distance of the radium from the part treated, and (5) the type of container, filters, etc., employed.

Any modification of these factors will produce entirely different results. The same number of milligram-hours applied under similar conditions does not produce the same reaction if some of the factors mentioned are different.

The character of the tissue must always be considered, especially when the parts have been subjected to previous irritation from other causes. In some cases a late reaction and ulceration have been caused by the application of an irritant such as iodine, mustard, and excessive heat after radiation. Due regard must be given also to the character of the tissues in the very old and very young. The opinion seems to prevail that it is safe to make a second application after the lapse of three weeks, but in the light of very late reactions that have occurred in certain cases, it is difficult to come to a definite conclusion. In the folds of the axilla and groin the reaction is greater, possibly because of the mechanical irritation of sweating, rubbing, or chafing.

The foregoing deductions apply to normal structures in which more or less uniform results are produced though there is some variation in the degree of their resistance. In pathologic structures the variation is far wider. The dosage factor must be worked out upon clinical lines rather than in the laboratory.

In conclusion the author emphasizes the importance of including in the reports of cases the details as to the amount of radium used; its distribution; the time of application and, if the treatment is repeated, the length of the intervals; the filters; and distance of the radium from the affected part. If the radium is implanted, the exact method, the amount used, its distribution, the reaction observed, the relation of the diseased to healthy parts, and the results obtained should be reported.

ADOLPH HARTUNG, M.D.

Viol, C. H.: A Comparison of Radiation Dosages Attainable by the Use of Radium on and within Tumors. *Am. J. Roentgenol.*, 1922, n. s. ix, 56.

The immediate problem in the radiotherapeutic treatment of a localized malignant growth is to secure an adequate or lethal dose of rays in the most outlying cells as failure to accomplish this leaves the patient in much the same predicament as that which results when the surgeon cannot excise all of the malignancy.

If absorption is not taken into consideration, the intensity of the rays from a small source varies inversely as the square of the distance from the source. Since gamma rays of radium are so penetrating that the decrease in their intensity due to absorption in the tissues is markedly offset by the effect of scattered and secondary rays in the tissues, it is not necessary to consider absorption. If the distance from the radium to the most outlying cells is set as 1, then the intensity of the rays on those

cells is $\frac{1}{(1)^2} = 1$. If by insertion of the radium into

the tumor mass the distance between the radium and the most outlying cells is reduced to one-half,

the intensity of the rays becomes $\frac{1}{(\frac{1}{2})^2} = 4$.

It follows then that with the same amount of radium inserted for the same length of time the ray dose applied to the most outlying cells will be increased fourfold.

It is the utilization of this principle by multiplying the number of points from which the rays emerge that makes it possible to obtain almost homogeneous radiation and to secure the most intense effects of the radiation within the tumor, thereby avoiding the great waste of rays that results when external crossfire is used and preventing the possible undesirable effects of these wasted rays in normal tissues adjacent to the neoplasm.

The future developments in radium technique which promise most are those which will place the radio-active substance throughout the mass of neoplastic tissues. It is only in this manner that malignant growths such as cancer of the bladder, prostate, stomach, etc., whose the prognosis is today far from favorable, can be controlled by radiotherapy combined with other suitable methods.

ADOLPH HARTUNG, M.D.

Loucks, R. E.: Pathological Classification of Thyroid Gland Diseases with Radium Treatment in Toxic Goiter. *Am. J. Roentgenol.*, 1922, n. s. viii, 755.

Thyroid diseases are classified under three heads: (1) inflammations, (2) tumors, and (3) dystrophies. Each of these has subgroups. Plummer's classification of hypothyroidism and hyperthyroidism is given. The author discusses only the treatment of the toxic or active types in forms of toxic adenomata and exophthalmic goiter.

The toxic adenoma is characterized by a chain of symptoms gradually increasing for a period of years after the enlargement of the thyroid gland.

The exophthalmic type generally runs a typical course. Mild toxic symptoms gradually increase for about eight months to a crisis with or without enlargement of the gland. This first explosion is usually followed by improvement until the end of the second year, when the second crisis comes. From the second crisis the patient may alternately fail and improve or fail rapidly with cardiac and general degeneration.

The thyroid is the regulator of metabolism and its functioning is well indicated by the metabolic rate. McCaskey is quoted as stating that in 90 per cent of all cases showing an increase in the metabolic rate there is hyperthyroidism proportionate to the increase.

The exophthalmic type causes an early slight increase in the blood pressure which is followed by a fall after the first crisis and then by another increase which is maintained.

There are many theories as to the etiology. One attributes it to the effect of conditions in goiter regions such as Michigan, Minnesota and Switzerland. Another ascribes it to infections precipitated by violent emotions. Disturbances of abdominal

viscera, and disturbances of the endocrines at puberty, pregnancy, and the menopause have also been suggested as causes.

In discussing the symptoms Loucks states that hyperthyroidism is suggested by a florid blotchy skin, tachycardia which is not dependent upon an organic cardiac lesion, sweating palms, longitudinal striae of the nails, and pain over the sternoclavicular joints.

Symptoms of a poor prognosis are: (1) bulging of the eyes which has been present for two years or more, (2) a pale muddy complexion and edema of the extremities, (3) an irregular pulse rate of 140, (4) a high blood pressure, (5) emaciation with rapid loss of weight, (6) a strong apex impulse with pulsation of the intercostal muscles over the heart, (7) increased cardiac impulse with accentuation of the second sound or both sounds, (8) an apex rate of 180 and a pulse rate of 120, (9) urinary symptoms characteristic of failing heart action and a high metabolic rate, (10) persistent diarrhoea, (11) cerebral symptoms and acidosis, and (12) a positive Wassermann reaction.

Treatment should be begun by cleansing the bowels with a saline cathartic, rest in bed, a non-protein diet, an ice bag over the gland and precordia, alkaline medication, alkaline baths, and medication in the form of bromides, ergot, or sodium cacodylate. If two weeks of such treatment does not overcome the toxæmia, X-ray treatment, surgery, or radium treatment is indicated.

After careful consideration the author has come to the conclusion that the method of choice is the use of radium following the employment of the general methods mentioned for two weeks if necessary.

At least 100 mg. should be used in four tubes screened with 1 mm. of brass and 1 mm. of rubber at a distance of 2 cm. from the skin. Two or three ports should be irradiated from eight to ten hours each.

Loucks then gives in detail the histories of five cases treated in the manner described.

The results of radium treatment are summarized as follows:

1. In the absence of permanent heart and kidney lesions, a high blood pressure was lowered.
2. The blood pressure was raised when compensation was re-established.
3. A metabolic rate of about 80 was lowered during the first two weeks, raised during the third and fourth, then gradually decreased during the next few months.
4. A metabolic rate above 100 in cases of broken compensation was gradually lowered after the third week.
5. In many very active cases the metabolic rate was normal after three months.
6. The metabolic rate is a standard of toxic activity and its measurement indicates further treatment, verifies clinical findings, and proves the results of treatment.

A. J. LARKIN, M.D.

Hanford, C. W.: Radium Technique in Treating Cancer of the Œsophagus: Preliminary Report.
J. Am. M. Ass., 1922, lxxviii, 10.

Except in the use of the fluoroscope, we are working in the dark in the treatment of carcinoma of the œsophagus. The thickness of the growth and its extent along the lumen of the œsophagus cannot be determined. Data obtained from the few autopsies constitute the basis of the treatment of the case at hand. Diseased areas are 1 to 2 in. in length. One portion of the wall is thick and will stand radiation which would have an unfavorable effect on thin portions of the growth. The determination of the dosage is difficult. The giving of small doses when perforation is feared has the disadvantage that a favorable effect is exerted on only the nearby tissue while a stimulating effect may be exerted on the more distant cells of the growth. The minimal dose given must be sufficient to have a lethal effect on the most distant cells.

The author states that he is obtaining fair results in these cases with the aid of the fluoroscope, dilators, œsophagoscope, and radium as a definite anticancer agent. While many cases of this kind cannot be cured, the canal can be kept open and gastrostomy can be made unnecessary by dilatation and the judicious application of radium.

The five requisites for efficient œsophagus application as given by Mills and Kimbrough are as follows:

1. Knowledge of the location, extent, and peculiarities of the tumor, and of the location, extent, and direction of the stricture.
2. Means by which the cancer stricture can be canalized harmlessly.
3. Means by which the radium can be maintained in position.
4. Means by which the applicator can be observed frequently while in position.
5. Careful selection of dosage intervals, etc.

Methods employed in determining the location of malignancy in the œsophagus are: (1) the use of the fluoroscope after the ingestion of barium or bismuth, (2) sounding with olivary bougies, and (3) œsophagoscopy (used chiefly to secure tissue for examination).

To locate the stricture a roentgenogram is made after the ingestion of bismuth. With the patient before the fluoroscope the olivary bougie is passed on spiral wire and when the stricture is reached the site of the incisors on the wire is marked with adhesive. The wire is then removed and used to measure the radium carrier. It is supposed that the malignancy extends below the point of stricture. The author justifies the possible attack on normal tissue on the ground that such tissue will recover.

If the olivary bougie will pass the stricture the radium carrier also will pass it. More often, however, the stricture will not admit the olivary bougie or radium carrier. In such cases recourse is had to the method popularized by Sippy. A silk cord (silk twist Letter D) is swallowed by the patient and after

it has become anchored in the bowel it is used as a director for a wire three feet long and having a solid tip. The cord passes through an aperture in the tip and with the cord kept taut the tip is usually passed through the stricture easily. Graduated olivary bougies can be attached serially to the wire and passed until the dilatation is sufficient to admit the radium carrier. A detailed description of the technique and illustrations of this procedure and an illustration and description of the radium carrier are given. The author states that the silk cord, which is the only connection with the radium, is much less objectionable than wire to hold the applicator in place. To assure the proper location of the carrier during the application a roentgenogram should be made immediately after the application and again in six hours.

Dosage is empirical. The author has selected 50 mg. for eight to ten hours. If the lesion is longer than the applicator the radium is placed at the deepest portion in the first period of eight hours and then withdrawn its full length until the entire lesion is irradiated. The radium is screened with 1 mm. of brass and 1 mm. of rubber. The treatment is not fully satisfactory but improves the prognosis.

Of fifteen cases four are seemingly cured. All patients treated by the author were benefited. Dysphagia was relieved and freedom from pain was secured for some time. Second treatments were not so successful as first treatments. Excluding the four cases believed to be cured, five went one year without recurrence. In one there has been no recurrence for one and a half years. These five are still under treatment. The most encouraging feature is the relief of the dysphagia.

The second treatment is given from three to four weeks after the first.

A. J. LARKIN, M.D.

Stacy, L. J.: The Treatment of Primary Carcinoma of the Vagina with Radium. *Am. J. Roentgenol.*, 1922, n. s. ix, 48.

Primary carcinoma of the vagina is comparatively rare and reports of cases treated with radium are few, only three having been found by the author in the American literature. The course of the disease is very rapid; glandular involvement occurs early because of the free lymphatic supply of the vaginal mucous membrane. Surgical treatment has been disappointing and the cure of the local growth by means of radium is frequently followed by glandular involvement.

Of the twenty-one patients with primary carcinoma of the vagina treated at the Mayo Clinic from July, 1915, to January, 1921, information concerning fourteen has been obtained recently in answer to questionnaires. Seven of the fourteen are living: 1 three years and nine months, 1 two years and nine months, 1 two years and one month, 1 one year and two months, 2 six months, and 1 five months since the treatment. Of those who died, 1 died two years and four months, 1 one year and three months, 1 one year, 2 eleven

months, and 2 seven months after the treatment. Summaries of the histories of the fourteen cases are given.

All the patients in this group were given roentgen treatments over the abdomen and back in conjunction with the local applications of radium. As the technique of radium treatment improves, the results will improve, particularly in the recent cases in which the emanation needles are buried in the growth or much larger doses of radium salt are employed. The increasing efficiency of the roentgen treatment is also an important factor. In the cases cited the local condition has been controlled comparatively successfully, but extension into the glands has not been prevented.

The author's conclusions are summarized as follows:

Radium and roentgen treatments offer better chances for cure than surgery, and as the technique improves a larger number of permanent cures should be effected.

Better results are obtained and there is less danger of the formation of fistula if the initial treatment with radium is heavy and not repeated but the roentgen treatment of the abdomen and back is continued.

ADOLPH HARTUNG, M.D.

LEGAL MEDICINE

Courts May Order More Than One Physical Examination. *City of Valparaiso vs. Kinney (Ind.)*, 131 N. E. R., p. 237.

The Appellate Court of Indiana, in reversing a judgment for \$2,500 damages obtained by the plaintiff, Kinney, for alleged permanent injuries to her left arm, elbow, and shoulder, held that there was an abuse of discretion in the trial court's refusal to order a second physical examination of the plaintiff by a physician or physicians to be appointed by the court. The court stated that the only physical examination that had been made theretofore under an order of the court was had about eleven months after the plaintiff had received her injuries and nineteen months before the trial of the cause. The injuries were of such a character that in the course of time they would probably improve spontaneously, even though a substantial cure might not be effected. Under such circumstances it must be evident that knowledge of the plaintiff's condition at the time of the trial, which occurred about two and one-half years after the injuries were received, would have been very helpful to the court or jury trying the cause.

It is well settled in Indiana that a motion to require a plaintiff to submit to a physical examination in actions of this kind is addressed to the sound discretion of the trial court, and that the exercise of such discretion is reviewable on appeal and correctable in case of abuse; and it is clear to the appellate court that courts have authority to order more than one physical examination of a plaintiff in an action for damages for personal injuries. It is apparent that

under certain circumstances a single physical examination may not, and possibly cannot, enable the courts to obtain, as nearly as possible, the exact and full truth concerning the matters in controversy. When such circumstances exist, the reasons which lead courts to assume authority to order physical examinations in the first instance afford ample justification for a further exercise of authority in that regard.

J. A. CASTAGNINO.

Liability for Burns from Fluoroscopic Exposures—Care Required. *Evans vs. Clapp et al. (Mo.)*, 231 S. W. R., p. 79.

The Kansas City, Missouri, Court of Appeals affirmed a judgment for \$5,000 damages for the plaintiff against the defendants, a physician and a hospital company, for alleged malpractice in the use of a fluoroscope which resulted in a burn. The plaintiff claimed that twenty exposures were made within eight days, while the physician insisted there were only eight exposures. The plaintiff had gone to him to ascertain the cause of headaches from which she suffered, and on the first examination with the fluoroscope he found the cause a ptotic or low-lying stomach. As the roentgen rays were not applied in this case for treatment, but merely to ascertain the cause of the headaches, which was

disclosed at the first examination, there was no reason to assume that an honest mistake had been made in the careful application of treatment. On the contrary, as the roentgen ray revealed the condition at once, the many other exposures were not made in the interests of the patient.

The rules governing the duty and liability of physicians and surgeons in the performance of professional services are applicable to them in the use and manipulation of a roentgen-ray machine. In employing this dangerous agency they must use such reasonable and ordinary care, skill, and diligence as is ordinarily possessed by others in the same line of practice and work in similar localities. It would seem, however, that the ordinary care required in the use of the roentgen ray would not be subject to quite the same distinction that is usually made between ordinary medical practice in a rural and in a city community, as the standard of care in the use of roentgen-ray machines must be derived from among the users thereof, and the term "similar localities" must, in this connection, have a somewhat general and relative meaning so as to include other users of such machines who possess the ordinary proficiency in, and acquaintanceship with, the use of that agency which obtains in similar localities or in the same section of the country.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Mathes, P.: Questions Concerning Prolapse and Retroflexion (Prolaps- und Retroflexionsfragen). *Zentralbl. f. Gynaek.*, 1921, xlv, 1429.

In the origin of prolapse in women who have borne children the most important factor is the bladder which, after the injuries caused by birth to the birth canal, favors prolapse by pressing on the surrounding parts. Prolapse in a virgin finds its explanation in the presence of an abnormally deep cul-de-sac of Douglas into which the intestinal loops thrust themselves, forcing the uterus before them and out of the pelvis. The deep cul-de-sac of Douglas is due to an arrest in development, a congenital variant which is associated with other signs of defective or arrested growth.

From these observations it is clear that operative methods to correct the supports of the uterus or to strengthen the buttress of the bladder are inadequate. Accordingly Mathes tried to prevent the sinking of the bladder by stitching the horns of the uterus to the periosteum of the pubic bone laterally from the vesical pillars. The result was not unfavorable, but the procedure presents technical difficulties. He now advocates a combination of interposition of the uterus with the Goebell-Stoeckel plastic operation on the pyramidalis muscle, proceeding from the standpoint that "it is hardly possible to conceive of a better anchoring of the neck of the bladder, the portion most in danger of prolapse, than by loops of muscle and fascia."

Three cases were operated upon in this manner successfully. Mathes' opinion as to the importance of a deep cul-de-sac of Douglas in cases of prolapse led him to use surgical means to lessen its size. By a purse-string suture which included the peritoneum and the posterior wall of the neck he effected its entire obliteration and opposed effective resistance to the pressure of the intestines.

For cases of uncomplicated retroflexion of the uterus, artificial obliteration of the cul-de-sac of Douglas with fixation of the uterus by the Baldy-Franke method is an appropriate procedure. Among less difficult methods, which are also reasonably certain in their results, is the median colpography of Le Fort-Neugebauer in which the anterior and posterior walls of the vagina are freshened and stitched together, the vaginal walls thus being prevented from sliding upon each other. The freshening must extend no further than to the lower third of the vagina; the freshened wall is then used for perineoplasty. All of the cases operated on by the Le Fort-Neugebauer method (40 per cent of those treated during the last two years) have remained free from recurrence.

Preliminary treatment is of the utmost importance for the successful outcome of any operation for prolapse. All ulcers due to pressure must be healed and it is advisable also to render the cervix and corpus as aseptic as possible by the use of disinfectant washes. LIEGNER (Z).

Garcia de la Serrana, M. J.: A New Procedure for Fixation of the Uterus (Ein neues Verfahren fuer die Uterusfixation). *Zentralbl. f. Gynaek.*, 1921, xlv, 1283.

The method of fixing the uterus which has been worked out by the author stands, as he expresses it, "on its own feet." Provided the prolapse of the anterior and posterior vaginal walls is not too pronounced and the perineum still forms a fairly good support, supplementary operations on the vagina and perineum are unnecessary. Relapses, the author believes, are almost impossible after this procedure.

An 8-in. laparotomy incision is made upward from the symphysis. The subcutaneous cellular tissue is separated from the fascia for a distance of 4 cm., and the fascia, muscle, and peritoneum are pierced laterally 3 cm. above the pubic bone with a pointed wire. The wire is then drawn under the round ligament and tube, through the broad ligament and the posterior half of the uterus without touching the lumen, and out on the other side, the abdominal walls then being pierced from within outward. The abdomen is closed by layers of sutures and the wire twisted above the fascia so that the uterus is held firmly against the anterior wall in a somewhat elevated position and in ante flexion. As the abdominal pressure then no longer operates on the retroflexed uterus, pressing like a wedge on the vagina, vaginoperineal operations are generally unnecessary.

The laparotomy incision is made under local anaesthesia, but narcosis is necessary when the uterus is brought forward. Four cases have been treated by this method, two of them a year and a half ago. In the cases of multiparae the tube was ligated to produce sterility if this was desired. The author does not know whether the bearing of children will again be possible in these cases but states that if pregnancy should occur the wire could be removed in the second or third month by a small incision.

KULENKAMPPF (Z).

Bonney, V.: The Radical Abdominal Operation for Carcinoma of the Cervix: Results of 100 Cases. *Brit. M. J.*, 1921, ii, 1103.

The author compares the results of 100 cases previously reported by him and Berkeley with his own series of 100 cases on the basis of five years of freedom from recurrence.

The operation performed for carcinoma of the cervix was the most thorough possible, consisting in the removal of the uterus and its appendages, the upper half or two-thirds of the vagina, and the parametric and paravaginal tissues out to the pelvic side walls and down to the levator ani and the glands in the obturator fossæ and along the iliac vessels.

The results are tabulated as follows:

	Author's series	Joint series
Died of operation.....	20	20
Died of recurrent growth.....	33	32
Died of other disease.....	3	2
Lost sight of.....	4	7
Well after five years.....	40	39
	100	100

A comparison based on involvement of the regional glands is given in the following table:

	Glands carcinomatous.		Glands not carcinomatous.	
	Author's series	Joint series	Author's series	Joint series
Died of operation.....	9	9	11	11
Died of recurrent growth	17	16	17	16
Died of other disease....	1	1	2	1
Lost sight of.....	2	2	1	5
Well five or more years..	9	7	31	32

The deaths from recurrence occurred in thirty-three cases as follows:

	Author's cases	Joint cases
Within 2 years.....	15	15
Between 2 and 3 years.....	12	10
Between 3 and 4 years.....	3	1
Between 4 and 5 years.....	3	6

Forty of the patients remained well after five years.

The series of 100 cases reviewed in this article were selected from 160 consecutive cases presented for treatment. In 1,000 cases of carcinoma of the cervix not operated upon, the average length of life from the onset of symptoms was one year and nine months.

As the operation described is of great technical difficulty, the results obtained show a gradual decrease in the mortality from 20 per cent in the first 100 cases to 6 per cent in the last fifty cases.

I. E. BISHKOW, M.D.

Rawls, R. M.: The End-Results of Amputation of the Cervix and Trachelorrhaphy. *Am. J. Obst. & Gynec.*, 1922, iii, 1.

The author's plan of study was to classify and tabulate the immediate and end-results of 693 cases from hospital records. The personal equation was eliminated as in the great majority of the cases the findings were recorded by a number of examiners. The conclusions drawn are as follows:

1. Amputation of the cervix and trachelorrhaphy are effectual and adequate operations and have a definite place in the gynecology of to-day.

2. Secondary hæmorrhage and secondary union occur more often after trachelorrhaphy and are due to faulty technique rather than infection.

3. Improvement in the general health occurs in over 82 per cent of the cases treated by each operation but is greater after amputation of the cervix.

4. Amputation of the cervix is more efficient than trachelorrhaphy in the cure of leucorrhœa and dysmenorrhœa but is more often the cause of these symptoms in cases previously free from vaginal discharge and menstrual pain.

5. Voluntary sterility is increased by cervical and vaginal plastic operations, but, all other things being equal, sterility is 11 per cent greater after amputation of the cervix than after trachelorrhaphy.

6. Amputation of the cervix is followed by interruption of labor before full term more often than trachelorrhaphy but is no more liable to end in premature labor. Abortion is more frequent after amputation in proportion to the number of high amputations.

7. Dystocia is greater after trachelorrhaphy as evidenced by the number of operative deliveries and by difficulty in spontaneous labors.

8. With proper indications and technique, low or medium amputation is as applicable to women in the child-bearing age as trachelorrhaphy.

C. H. DAVIS, M.D.

Keene, F. E.: The Value of Radium in Gynecology. *N. York State J. M.*, 1922, xxii, 1.

The author's observations since 1913 cover 501 cases of benign, and 412 cases of malignant, conditions of the female pelvis. He states that radiotherapy has passed the experimental stage, but it does not supplant or compete with surgery. Disastrous results will follow the misapplication of radium or the X-ray.

Certain types of myomata and myopathic uterine hæmorrhage are treated exclusively with radium without untoward results. The author is confident that in the great majority of cases the results can be anticipated.

Myomata contra-indicating radium treatment are classified as follows:

1. Tumors larger than a four months' pregnancy and those which are complicated by inflammation or tumor of the adnexa.

2. Tumors not producing hæmorrhage but whose chief clinical manifestation is pressure.

3. Tumors associated with cachexia out of all proportion to the amount of blood lost.

4. Tumors distorting the uterine cavity so that radium cannot be inserted to the fundus.

5. Pedunculated tumors concealed within the uterine cavity or projecting from the cervical canal.

6. Calcareous or rapidly growing tumors associated with intermenstrual as well as menstrual pain.

7. Tumors in young women, since radium in sufficient amounts to affect the tumor may produce sterility or a premature menopause.

8. Tumors of moderate size in patients in whom the possibility of a gastric, gall-bladder, or other extrapelvic abdominal lesion may suggest laparotomy. In such cases operation is done and further procedure then decided upon.

The use of radium alone is reserved for small uncomplicated tumors whose only symptom is hæmorrhage, and for the so-called myopathic uterine hæmorrhages. Under these conditions 95 per cent of the cases are cured by one application. In very rare cases myomectomy or hysterectomy must be done. The technique of the radium treatment is as follows:

Under nitrous oxide and oxygen anaesthesia a careful pelvic examination is made. Thorough curettage is done and the scrapings are examined microscopically. A 50-mgm. tube properly filtered is inserted to the fundus for twenty-four hours in the cases of patients at or near the menopause and for a proportionately shorter time in the cases of younger women. In the cases of young women a second application is preferable to over-radiation.

The patient is kept in bed for three days and allowed to go home on the fifth day. Nausea or vomiting occurs in 60 per cent of the cases while the radium is in place. An elevation of more than one degree of temperature is rare. Pain in both sides of the pelvis for several weeks is usually due to undiscovered adnexal inflammation. No irritable effects on the bladder or rectum have been noticed and no phlebitis or nephritis.

The first menstrual period after the radiation may be the same or more severe. The following periods are scanty or absent, and when a twenty-four-hour application is given the amenorrhœa is permanent. A second application is only occasionally necessitated by recurrence after several months. Smaller doses reduce the extent and duration of the flow but not amenorrhœa. Leucorrhœa for six to ten weeks may complicate amenorrhœa but it is not excessive or irritating. The general symptoms are those of the menopause and relatively minor.

The conclusions drawn are as follows:

1. Radium treatment is the treatment of choice for small myomata whose chief symptom is hæmorrhage. Ninety-five per cent of such cases and cases of hæmorrhage are cured. Re-application or operation is rarely necessary.

2. A large group of myomata are operative cases.

3. In selected cases the myomata diminish gradually even to disappearance and the uterus suffers no ill effects from the radium.

4. There is no mortality and a minimum of morbidity following radium treatment.

5. The chief subjective symptoms are those of the menopause and are of relatively minor importance.

Malignant tumors are divided into two groups, the advanced cases beyond cure and the early cases.

Of the latter group the author does not speak as most of them are operated upon.

Women in the last stages have been given the temporary benefit of radium treatment but the author deems the practice unwise. Among such cases are cases with extension to the bladder and rectum. In rare instances a remarkable result is obtained even in this type.

In general, 100 mgm. have been used in these cases either against the tumor or embedded in it in needles. The first application is usually for twenty-four hours. In many, a shorter application has been given in six weeks. The bladder and rectum are packed away with gauze.

The results are pleasing to the patient even though in most cases they are only temporary. Before the discovery of radium even this degree of palliation could not be obtained.

The gross changes in cancer of the cervix are briefly described. Within a few weeks all superficial evidences of malignancy disappear and the ulcerated area is covered by a thin yellow membrane smaller than the original lesion and adherent to the adjacent tissues. The vaginal wall close by is red and may bleed slightly on examination. The profuse hæmorrhage and malodorous discharge have ceased and have been replaced by a thin non-irritating leucorrhœa. Several months later a pale contracted vagina due to fibrous tissue formation is usually found.

Such local healing occurs in from 50 to 60 per cent of cancers of the cervix. In a larger proportion of the cases the malodorous discharge is stopped and never recurs or recurs only at varying intervals before death. Pain is often relieved or lessened if only for a few months to recur again with re-invasion.

Occasionally pain follows and is an effect of radium treatment. This occurs more frequently after the second or third application. Cystitis and proctitis occurred more frequently in the author's earlier cases than they do to-day. Seventeen rectovaginal or vesicovaginal fistulæ developed in the first 200 cases; these are not ascribed to the radium, however, as fistulæ are more common in untreated cases. Radium decreases the likelihood of fistula. Two deaths occurred soon after the radiation but both were those of extremely cachectic patients.

In early operable cases radium was used only once and this patient has passed the five-year period free from recurrence. Of ninety-four women with inoperable malignant tumors of the cervix who were treated prior to or during 1916, 20 per cent are living and to all appearance are free of the disease.

Operation is advised for cancer of the fundus even in fairly advanced cases. Radium is reserved for cases in which operation is contra-indicated. Borderline cervix cases are given radium treatment. It is inadvisable to operate upon a case previously treated with radium because of the fibrosis and the fact that cells rendered inert by the radium may be set free. Radium is applied to the vaginal vault two weeks after operation but not at the time of

operation because of the danger of widespread sloughing of cells weakened by trauma. The author is still of an open mind as to pre-operative radiation.

The conclusions to be drawn from this study are as follows:

1. As a palliative measure radium therapy is the treatment *par excellence* for inoperable cases of cancer of the cervix and vagina.
2. In borderline cases the use of radium is advisable but in certainly operable cases surgery with postoperative radiation is indicated.
3. Cancer of the fundus is surgical except in the presence of a grave contra-indication, when radium should be used.
4. Hysterectomy is inadvisable in cases previously treated with radium.
5. In the operable cases the advisability of pre-operative radiation is still an open question.
6. Local irradiation of cancer by radium is established and there is hope that cancer of the cervix may be treated by radium rather than by operation.

A. J. LARKIN, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Nash, W. G.: *Hæmosalpinx and Pyosalpinx with Torsion of the Right Fallopian Tube*. *Lancet*, 1922, ccii, 78.

A single girl, aged 18, was admitted to the hospital complaining of acute pain in lower part of the abdomen on the right side. Her history showed that she had had three previous attacks of the same kind, one two years previously, which had lasted fifteen hours, another one month previously, and a third, six days previously, which caused vomiting.

Menstruation began at 16. At first it was irregular, but after the age of 17 became regular and profuse. At the time of admission to the hospital the temperature was 99.4 degrees F. and the pulse 112. The tongue was coated and there was tenderness in the right iliac fossa.

The appendix was removed but appeared normal. The right fallopian tube was found to be much enlarged and purple due to its being twisted five and one-half turns; the left tube was enlarged and adherent to the pelvic floor. Both tubes were removed. The patient made a good recovery.

The pathologist reported bilateral pyosalpinx and that the wall of the twisted right tube was intensely congested and lined with blood clot. The patient denied gonorrhoeal infection.

CLAYTON F. ANDREWS, M.D.

Daniel, C.: *Interstitial Pregnancy*. *Surg., Gynec. & Obst.*, 1922, xxxiv, 15.

The variable development of interstitial pregnancy and the symptoms peculiar to each case render clinical diagnosis almost impossible. Even the macroscopic anatomy of the specimens presents obscure points. Vaudecal claims that microscopic

examination is the only absolute means of confirming the presence of the condition.

The author presents the history, the findings, and photographs of two cases.

In the early stage in almost all of the reported cases there was a short delay in menstruation followed by mild or profuse metrorrhagia. The anatomical characters depend, according to Vaudecal, upon the point of primary implantation of the ovum. There are three principal characteristics which should be considered in the diagnosis, viz., asymmetry of the uterus, asymmetry of the adnexa, and lateral insertion of the round ligament.

Uterine asymmetry, or the Ruge-Simon sign, is characterized by elevation of the fundus on the side of the abnormal horn. Because of the abnormal insertion and the habitual tendency of an interstitial gestation to develop at first upward, there is verticalization of the fundus of the uterus producing a cone-shaped organ.

Asymmetry of the adnexa is caused by the drawing up of the tube on the gravid side by the development of the ovum.

The insertion of the round ligament varies according to the attachment of the tube. In general, the round ligament is attached lateral to the foetal tumor and displaced laterally with the tube by the development of the ovum. Unfortunately these anatomical characteristics are of little clinical value except in the cases of thin women with a flaccid abdominal wall.

Microscopical study of an interstitial gestation should include a study of the ovarian cavity, the uterine cavity, both tubes, and both ovaries.

The ovarian cavity is embedded in the musculature of the uterine wall and produces a slight decidual reaction at the point of implantation.

Histologic examination shows that the tubes and ovaries are normal on both the gravid and non-gravid sides.

C. H. DAVIS, M.D.

Woolf, A. E. M.: *Bilateral Interstitial Ruptured Ectopic Gestation Sacs*. *Lancet*, 1922, ccii, 11.

The patient had been married for seven years and had one child 6 years old. On the morning of April 14, 1920 (i.e., five days previous to her admission to the hospital), while dressing, she was seized with sudden sharp pain in the left side of the abdomen which caused her to double up. This pain lasted all day, but passed off at about 7 p.m. The following three days she felt quite well except for slight weakness. On April 18, about 10:30 a.m., she was again seized with acute abdominal pain which was general throughout the abdomen and caused her to faint. The pain was then continuous until she was admitted to the hospital on the following afternoon. Vomiting was frequent April 18 and 19.

When the peritoneal cavity was opened a large quantity of dark-colored blood escaped. The right tube was seized and clamped. In the intramural portion of both tubes ruptured gestation sacs were found. A large hæmatocele was present on the left

side and the pelvis contained numerous blood clots. As the patient was in a precarious condition, the most rapid operative procedure was obviously essential. A subtotal hysterectomy was therefore performed. The patient stood the operation well and made an uneventful recovery.

The catalogue description of the specimen is as follows: A coronal section of a uterus which was excised. In the wall there is on either side at the upper angle a mass of blood about the size of a cherry which represents an interstitial pregnancy. In the clot on the left hand side may be recognized one or two uncolored foci which microscopic examination shows to consist of chorionic villi. The sac on the right hand side has ruptured and from it there projects an irregular eminence of coagulum. The uterine mucosa has undergone simultaneous thickening and is hyperæmic; the muscular wall is hypertrophied.

E. L. CORNELL, M.D.

Jayle, F., and Halpérine, J.: Tubal Pregnancy and Blind Diverticular Canals of the Tube (*Gros-sesse tubaire et canaux borgnes diverticulaires de la trompe*). *Presse méd.*, Par., 1922, xxx, 33.

Medical literature is singularly deficient on the subject of anomalies of the fallopian tubes. One anomaly little known is the formation of blind accessory diverticular canals parallel with the normal canal of the tube. In exceptional cases there are two or more such diverticula.

Baudelocque first drew attention to these canals in 1825 by reporting a case showing bifurcation of the tube. In 1898 Henrotin and Herz of Chicago reported an ectopic pregnancy in such a diverticulum. In 1903 Hensius examined twenty-five cases reported as cases of diverticula of the fallopian tube but found only five to be genuine.

In the authors' opinion the development of ectopic pregnancy in a tubal diverticulum is not rare as they have observed four such cases in a short space of time. Cases of this kind are not often reported because a very careful examination is necessary to discover the diverticulum and a search is seldom made for the malformation because it is not well known.

The authors report the case of a woman 29 years of age in which a diagnosis of retroversion was made. At operation the left tube was found to have three canals, one of which had been ruptured by an extra-uterine pregnancy.

W. A. BRENNAN.

Darnall, W. E.: An Unusual Tumor of the Ovary. *Virginia M. Month.*, 1921, xlviii, 540.

The patient was an unmarried woman, 52 years of age, who had passed the menopause six years previously. Being a Christian Scientist, she had refused to submit to surgical treatment for a fibroid tumor and had been given X-ray treatments instead. These had produced a burn, the size of a saucer, which would not heal. The patient finally consented to an operation. An oval incision was made and the burned area dissected out down to the fascia.

A large movable tumor was discovered attached to the left ovary, with the elongated end of the left tube stretched over it. This growth, which was found to weigh 25 lbs. and to contain creamy sterile pus, was removed. At its base several lumpy projections protruded into the pus cavity which were hard to the touch and cut like fibrous tissue. The walls of the cavity were composed of fibrous tissue 1 in. thick.

After a careful study of this case the conclusion was drawn that the tumor was originally a fibroid tumor of the ovary which ultimately began to degenerate from within, the injudicious treatment with the X-ray no doubt having favored the process or having started it. The suppuration then continued until finally liquefaction of the whole tumor occurred with the result described.

The patient's recovery was uneventful. The skin incision united perfectly. After a year and a half she reported herself in excellent health.

C. H. DAVIS, M.D.

Kerr, J. M. M.: Chorio-Epithelioma. *Lancet*, 1922, ccii, 9.

Two cases of vaginal removal of the uterus followed by recovery are reported. From these it is evident that the clinical features of chorio-epithelioma are just as definite as its pathologic characters. There has always been a pregnancy. Generally there has been an abortion, and in about 50 per cent of cases the body expelled has been a vesicular mole. In a very few cases the tumor has developed after an apparently normal full-time pregnancy. Probably if the placenta had been examined more carefully in such cases some of the villi would have shown hydatiform degeneration for this is occasionally observed when a full-time healthy child is born. Occasionally the tumor has developed while the ovum was still in the uterus. In rare cases the uterus has been found free of tumors, the primary growth having healed.

The outstanding symptom is hæmorrhage, which often is very profuse. Most commonly this is attributed to a retained portion of ovum or placenta. If the hæmorrhage is not immediately dealt with, it may cease for a time, but soon recurs. Still later, as the disease advances and ulceration occurs, pronounced anæmia and cachexia develop, with febrile pulse and temperature. At any time anomalous symptoms due to lesions in the brain, lungs, or elsewhere may develop, indicating that metastases in these organs have occurred.

Of the author's eight patients two died as a result of the operation, two died of metastases, two who were operated on many years ago are still alive, one who was operated upon a year ago is still well, and one has not been traced.

Taking early and late cases together, a permanent cure may be expected in only about 30 per cent. The outcome is therefore a little worse than in cases of carcinoma of the uterine body. Kerr has performed vaginal hysterectomy three times and the abdominal

operation five times. In one of the worst cases the patient was so collapsed and anæmic that he performed the vaginal operation and employed clamps to control the blood vessels in the broad ligament.

It is unnecessary to do a Wertheim operation in this condition as the glands are rarely, if ever, affected. Moreover, it takes a considerable time, and in all cases the shorter the duration of the operation and the less blood lost the better the chances of success.

E. L. CORNELL, M.D.

MISCELLANEOUS

MacKenzie, D. W.: Vagino-vesical and Utero-vesical Fistulæ. *J. Urol.*, 1921, vi, 61.

In this article attention is called to the fact that many patients with vesicovaginal or uterovaginal fistulæ have been operated on one or more times before they come under the observation of the urological surgeon. One of the author's patients had undergone seven operations, another twelve, and a third, with complete loss of the floor of the bladder, had undergone eighteen operations before admission to his service.

An important point emphasized is the necessity for definitely locating the ureteral openings and the

vesical opening of the fistula and ascertaining all possible facts regarding the course and position of the sinus before attempting operation. Attention is directed also to the necessity for improving the condition of the tissues as much as possible before operation by means of urinary antiseptics and local treatment, such as irrigations, baths, etc.

When the opening of the fistula is high in the fornix and there is much scar tissue the author makes two free lateral incisions in the perineum—lateral episiotomy wounds. He then places catheters in the ureters and a catheter from the bladder to the vagina through the fistula to serve as guides. The bladder must be dissected freely from the vagina; unless this dissection is carried out thoroughly the possibility of cure is remote. The sinus is inverted into the bladder and the vagina loosely sewed over it. The lateral incisions are then closed and the vagina is packed with gauze.

MacKenzie places great stress upon the post-operative treatment because carelessness at this stage may destroy all hope of final success. The bladder is emptied by frequent catheterization or with a permanent catheter and the patient kept in bed from fourteen to eighteen days. In his series of eleven cases there were no deaths.

HERMAN L. KRETSCHMER, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Willson, P.: Uteroplacental Apoplexy (Hæmorrhagic Infarction of the Uterus) in Accidental Hæmorrhage; Report of a Case and a Study of the Clinical and Pathologic Data of Sixty-Eight Cases in the Literature. *Surg., Gynec. & Obst.*, 1922, xxxiv, 57.

On the basis of his study, Willson draws the following conclusions:

1. Uteroplacental apoplexy is caused by the inundation of the uterine wall with a toxin of the nature of a hæmorrhagin which is liberated by the placenta and produces its maximum effect of course at the site of its absorption and greatest concentration.

2. In the great majority of cases, accidental hæmorrhage is probably a manifestation of the same process.

3. Clinically, the significant fact in the pathology is the damaged state of the uterine wall which tends to cause both intra-abdominal and postpartum hæmorrhage.

4. In severe cases, with undilated cervix, the most conservative treatment is abdominal cæsarean section followed by hysterectomy, if indicated, in order to assure certain hæmostasis.

R. E. CHRISTIE, M.D.

Yates, H. W., and Connelly, B.: The Treatment of Abortion. *Am. J. Obst. & Gynec.*, 1922, iii, 42.

In the series of cases observed there were eighty-one abortions and 256 pregnancies during a period of four and one-half months, making the incidence of abortion 1 to 31 pregnancies. Most of the cases occurred during the second month and the first half of the third month of pregnancy, no doubt because of nutritional and circulatory changes. About 25 per cent were criminal abortions.

In cases of abortion due to malnutrition or some condition such as diabetes, tuberculosis, or anæmia, rest, feeding, and reconstructive medication are indicated. Women who have shown an aborting habit should have an interval of one or two years between conceptions, and when pregnant should be kept in bed for several weeks under the influence of an anodyne. Enemas but not cathartics should be given. Luetics usually abort in the later months of gestation, but should receive intensive treatment until the Wassermann test is negative. In old cases treatment is of little avail and the pregnancy should be terminated.

In cases of hypertension, nephritis, hyperemesis gravidarum, and incipient tuberculosis the uterus should be emptied. The best method is dilation or hysterotomy. The use of rubber bags and bougies is unsurgical and slow, and often necessitates later

exploration. In cases of certain complete abortion, rest in bed for about ten days is all that is necessary. In cases of incomplete abortion, the sooner the uterus can be emptied the better. If the cervix admits one finger, the best procedure consists in removing the mass with a gloved finger under gas-oxygen anæsthesia. If this is impossible, the Longyear forceps may be used. If the cervix is closed, it should be packed with a strip of iodoform gauze and the gauze withdrawn in twenty-four hours. As a rule the products of conception will be removed with the gauze.

Signs of infection are not the only signs of trouble, for deciduitis and endometritis are often caused by retained placenta which should be removed.

Barring criminal abortion, neglected incomplete abortion is the most potent factor in sepsis, as the small retained products are a fruitful culture medium for pyogenic bacteria. The author never uses intra-uterine douches in cases of septic abortion. He prescribes rest in bed, opiates, enemas, and large hot packs over the entire abdomen. If the peritonæum is involved, he advises hypodermoclysis, glucose and bicarbonate of soda by rectum, morphine to tolerance, and liquids by mouth.

The morbidity which results from all types of abortion is appalling. It is greatest in the incomplete and septic cases.

To decrease the incidence of criminal abortion, patients should be told of the sequelæ of the contemplated act, especially as regards the wrecking of their health.

C. H. DAVIS, M.D.

LABOR AND ITS COMPLICATIONS

Crawford, M. A. D.: Spasmodic Stricture of the Uterus. *Brit. M. J.*, 1922, i, 135.

This condition was first described by Smellie in 1743. It is designated by various names but the author prefers DeLee's term, "strictura uteri," or the longer name, "spasmodic stricture of the uterus." This condition differs from Bandl's ring in that the constriction is in the uterus and cannot be diagnosed by outward palpation because the uterus retains its normal contour. In the majority of cases it occurs at the same site as Bandl's ring, i.e., at the junction of the lower and upper uterine segments.

The case reported by the author was that of a woman who had borne four children. The first child was delivered with the forceps after the mother had been in labor for three days. The second and third children were twins. One was delivered dead with the forceps but the other was born alive. The fourth child was delivered with the forceps alive; the mother had a complete perineal laceration.

The patient had been told the difficulty was "a shelf inside the uterus." In the labor reported by the author progress was slow. An intra-uterine examination revealed a tight contraction ring around the child's neck. Because of the severity of the pains the patient was put under deep chloroform anæsthesia and removed to a hospital. A 9-lb. baby was born spontaneously.

Various measures have been employed in such cases. DeLee states that in localized or general tetanus the uterus will not rupture spontaneously, but there is considerable danger of tearing it if an operation is done during the spasm. Forceps are dangerous and often it is impossible to apply them. The treatment preferred by Crawford is deep anæsthesia, if necessary prolonged.

I. E. BISHKOW, M.D.

Whitman, A.: Obstetrical Paralysis of the Peroneal Nerve. *Surg., Gynec. & Obst.*, 1922, xxiv, 32.

Paralysis of the peroneal nerve due to pressure on the main trunk of the sciatic nerve in its intrapelvic portion is comparatively rare. It is caused either by direct pressure due to a large head in a small pelvis or by trauma in the application of forceps.

Textbooks upon obstetrics, neurology, and orthopedics do not describe the condition in detail, referring to it merely indefinitely.

The author reports a case, giving the complete obstetrical, orthopedic, and neurological history. He draws the following conclusions:

1. In any case of paralysis below the knee developing after prolonged, difficult labor or an instrumental delivery, the possibility of intrapelvic injury to the sciatic nerve should be borne in mind.
2. An immediate orthopedic and neurological examination should be made to establish the differential diagnosis.
3. Apparatus should be applied immediately to prevent deformity and enable the patient to get about with the maximum facility.
4. The prognosis as to ultimate recovery should be exceedingly guarded.

C. H. DAVIS, M.D.

Ballantyne, J. W.: A Critical Review: Cæsarean Section. *Edinburgh M. J.*, 1922, n. s. xxviii, 28, 74.

Within the last three or four years cæsarean section has steadily gained in favor. Its indications have been more clearly defined, new indications have been recognized, the technique has been improved, and both the maternal and the infantile mortality has been decreased. On the other hand, the exact limits of the indications in cases of placenta prævia and eclampsia have not been fixed, the ideal technique in definitely and presumably infected cases has not been discovered, and the maternal mortality and morbidity have not been reduced so low that the obstetrician is justified in insisting upon the operation when there are alternative procedures involving less risk to the mother.

It is an interesting fact that a change in public sentiment regarding the value of antenatal life has had something to do with the extension of the cæsarean section to cases and conditions in which it would not have been considered ten or twelve years ago. While the mother's life is still regarded as of greater value than that of the foetus, no obstetrician now lightly performs a craniotomy upon the living infant, and the occasional occurrence of such a necessity is accounted as a failure in preventive midwifery. The immediate practical bearing of this new viewpoint is evident at once when the use of cæsarean section in placenta prævia is considered.

While opinions are not yet in agreement regarding the exact place of cæsarean section in the treatment of placenta prævia, there are indications of the probable restrictions which will be imposed on it. It will be used, for instance, for the child's sake rather than for the mother's. The reviewer is of the opinion that it is hardly wise to perform the section before the end of the eighth month of pregnancy and that it should be reserved for the central type of placenta prævia. There is nearly general agreement that the ideal case for section is one in which the cervix is still undilated and that therefore the procedure is particularly suitable for the elderly primipara with a rigid cervix. If possible, also, there should be absence of signs of infection, a restriction which tends to exclude the cases sent into the hospital with vaginal packing of small amount and dubious sterility. It goes without saying that the presence of an additional cause for difficulty in labor will often turn the scale in favor of section in an otherwise doubtful case.

Of the reviewer's series of cæsarean sections in recent years one was done for placenta prævia. The result was successful.

In cases of accidental hæmorrhage the field for cæsarean section is even more restricted than in placenta prævia. The procedure is to be considered only for very serious cases. The state of the uterine wall is such that contraction will not follow the section and therefore operative treatment usually consists of supravaginal hysterectomy.

The reviewer has done cæsarean section in one case of accidental hæmorrhage, but the original indication for the section was a small pelvis, the accidental hæmorrhage coming on in the period of preparation of the patient, probably because of fright. The mother survived, but the baby was asphyxiated at birth.

With regard to the treatment of eclampsia the author states that the general tendency at the present time is away from cæsarean section and if adequate supervision of pregnancy and medical measures in the pre-eclamptic state prove useful, this tendency will become still more marked until the procedure is abandoned entirely. Much depends, of course, on the discovery of the cause of eclampsia. If this should prove to be something formed in the foetus or placenta, the arguments for the rapid evacuation of the uterus will be strength-

ened and cesarean section and other operative measures will again come into favor. The reviewer has not done a section either for the pre-eclamptic state or for eclampsia as he holds firmly to the belief that the convulsions and toxæmia should be treated conservatively and the pregnancy left alone.

What may be called pelvic causes still form by far the most frequent indications for cesarean section. Chief of these is the contracted pelvis. Some of the pelvic causes, however, are rare. The generally contracted, the simple flat, and the rachitic flat pelvis are responsible for the vast majority of cesarean sections. Among the rarer conditions are the Robert, achondroplasiac, coxalgic, and obliquely contracted pelvises.

It is among the non-pelvic causes calling for cesarean section that the most rare and the non-recurrent indications are found.

The conclusion to be drawn from a study of the literature would seem to be that after a cesarean section every subsequent labor should take place in a hospital where expert operators can be found. Further, that any subsequent pregnancy should be under adequate antenatal supervision.

In the reviewer's opinion there seems to be no reason why cesarean section should not be performed more frequently for large infants as the large child is responsible for a condition exactly similar to that caused by the narrow pelvis.

A few modifications of the technique of the classical conservative cesarean section have been suggested during recent years, chiefly to lessen the risks in infected or presumably infected cases and to increase the strength of the uterine scar.

A good deal of discussion has dealt with the best suture material. Opinions differ also as to the method of inserting the sutures. Holland, who has made a special study of suture material, prefers silk-worm gut and regards silk as the second best. He condemns catgut. The reviewer has always made use of silk passed interruptedly for the deep suturing of the uterine wall and catgut passed continuously to bring the peritoneum together. In one instance in which he did a second cesarean some eighteen months later he could not discover any trace of the silk.

The acknowledged difficulty of dealing safely with presumably infected cases has been the basis for many suggested alterations in technique as it is generally admitted that the present maternal mortality even in cases treated by expert obstetricians is too high to justify the ordinary conservative high operation. Some obstetricians have sought a way out of the difficulty by making the incision low down in the uterus, the cervical or lower-segment operation.

The true extraperitoneal section is much less heard of now than formerly; the difficulty of reflecting the peritoneum from the bladder without buttonholing it and the fact that in many cases prevention of peritoneal infection is achieved only

at the expense of infection of the cellular tissue have militated against its general adoption.

Whether the problem of performing a cesarean section on a potentially infected case with safety to the mother has been solved by one or the other of the low transperitoneal operations cannot yet be decided definitely, but it will probably be settled soon. In the meantime some operators rely on removal of the uterus to save the mother from the septic peritonitis which so often follows cesarean section after the patient has been subjected to vaginal interference.

At the present time, therefore, there are three plans of dealing with the potentially infected uterus by abdominal section. There is first the employment of the conservative cesarean section, the incision in the uterus being made high and various refinements of technique being used to prevent peritoneal spilling of the infected liquor amnii and any leakage from the uterus through the closed incision. Not a few obstetricians believe that this is the best plan. In other words, they believe that potential infection of the uterine cavity should not be regarded as a complete contra-indication to an ordinary cesarean section. Certain safeguards are adopted, such as the opening of the uterus outside the abdomen, the changing of gloves after the removal of the membranes and placenta, the careful sponging of the edges of the incisions, the walling off of the peritoneal cavity, etc.

A second plan of dealing with the potentially infected uterus consists in the adoption of the low uterine incision and the so-called extraperitoneal or transperitoneal method of performing the cesarean section. Theoretically, this procedure should be successful, but in actual practice there has been some disappointment with the results. Difficulty in technique ought not to be, and will not be, a bar to the obstetrician testing these plans thoroughly, but it cannot be affirmed that the ideal operation has yet been devised, although Beck's method has much to commend it.

The third plan in the treatment of these cases consists of hysterectomy, the uterus being removed either unopened, as recommended by Lecoq, or after extraction of the child, as done by other obstetricians. The chief disadvantage of this procedure is its non-conservative character. In some cases, as in second or third cesarean sections, it may be accepted as a convenient plan of effecting sterilization, but in other instances, as in the cases of primipara with placenta prævia, it is not beyond reproach.

E. L. CORNELL, M.D.

Holland, E.: The Results of a Collective Investigation into Cesarean Sections Performed in Great Britain and Ireland from the Year 1911 to 1920 Inclusive. *J. Obst. & Gynec. Brit. Emp.*, 1921, xxviii, 358.

The chief information sought for was the maternal mortality of the operation as performed for various indications. The determination of the fetal and

infant mortalities was a lesser object. Full tables are given of the following groups of cases:

1. Contracted pelvis: (a) after attempted delivery with forceps or by craniotomy, (b) after induction of labor, (c) lower uterine segment operations, (d) cases of cesarean hysterectomy, and (e) fatal cases.

2. Cases of eclampsia and other toxæmias of pregnancy.

3. Cases of placenta prævia.

The number of cases in which the operation was performed for pelvic contraction was 3,972. The maternal mortality was 139 (4.1 per cent). The mortality rate for the series as a whole, however, does not yield much information; it is necessary to classify the cases:

Maternal Mortality: Contracted Pelvis

	Total cases	Maternal deaths	Mortality Per cent
Not in labor.....	1,202	19	1.6
Early in labor.....	389	7	1.8
Late in labor.....	220	22	10.0
After induction of labor.....	35	5	14.0
After attempts at delivery by forceps or craniotomy.....	107	29	27.0

The important points so far brought out by this analysis are: (1) the mortality of the operation *per se* has decreased, being now only half that in the cases collected by Routh up to 1910; (2) the mortality after long labor or attempts at delivery remains as high as ever. The 27 per cent mortality after attempts at delivery is a serious warning. The foetal mortality when forceps were tried was 27 per cent, and the early mortality of the infants who survived delivery nearly 11 per cent.

In 196 cases of eclampsia there were sixty-three maternal deaths; deducting one case of postmortem cesarean section, the maternal mortality was sixty-two deaths in 195 cases (31.8 per cent). Again deducting five cases of vaginal cesarean section with one death, the maternal mortality of abdominal cesarean section for eclampsia was sixty-one deaths in 190 cases (32 per cent).

One hundred and forty-seven (75 per cent) of the patients were primigravidae, twenty-six had had from two to five children, and nine had had from six to nine children. Regarding the parity of fourteen there is no record.

The total mortality among the children was 50 per cent, the foetal mortality rate being 32 per cent and the mortality rate among the survivors, 26 per cent.

There were 208 cases of antepartum hæmorrhage, comprising 139 cases of placenta prævia, sixty-six cases of accidental hæmorrhage, and three cases of free intraperitoneal hæmorrhage. In two of the latter the bleeding came from a ruptured vein on the wall of the uterus; in the third, the source of the bleeding was not found.

Maternal Mortality of Placenta Prævia

Type	Cases	Deaths	Mortality Per cent
Complete and central.....	78	11	14.0
Incomplete, etc.....	43	4	9.3
Type not recorded.....	18	1	—

The number of children to be considered was 138 (no record regarding the child in one case, and twin-pregnancy in one case). The number of foetuses born dead was ten, a foetal mortality of 7 per cent. The number of children who died during their stay in the hospital was twenty-nine, an infant mortality of 22.3 per cent among the 128 children who survived birth.

The very low foetal mortality is, of course, extremely flattering to cesarean section as the mortality associated with the more conservative methods of version and the use of hydrostatic bags is generally given as from 40 to 60 per cent.

In sixty-six cases of accidental hæmorrhage there were eighteen maternal deaths, a mortality of 27 per cent. Among the fifty-eight cases of "concealed" and "concealed and revealed" hæmorrhage, there were seventeen deaths, a mortality of 29 per cent. Among the eight cases of accidental hæmorrhage the mortality was 12 per cent.

The striking point brought out here is that the mortality after cesarean hysterectomy (46 per cent) was about four times as great as that after simple cesarean section.

The foetal mortality among the cases of concealed and concealed and revealed hæmorrhage was extremely high, 86 per cent.

In the remaining 366 cases the indications for operation were so many and various that a satisfactory classification is not easy. They are grouped as follows:

1. Conditions causing, or apt to cause, obstruction or prolongation of labor, 259 cases: (a) in the pelvic viscera or birth canal, or (b) in the foetus.
2. Grave diseases threatening the mother, sixty-one cases.
3. Foetal states other than those included in 1 (b), twenty cases.
4. Rupture of the uterus, nine cases.
5. Miscellaneous indications, seventeen cases.

Of the eighty-eight women with fibromyoma of the uterus, nine died, a mortality of 10 per cent. In forty-two cases hysterectomy was performed with four deaths; in twenty-three cases, myomec-tomy, with three deaths; and in the remaining twenty-three, simple cesarean section, with two deaths. The number of still-born foetuses was eleven. The number of children dying later was also eleven.

Of the eleven still-born foetuses, one was anencephalic, nine were delivered in obstructed labor, and one was delivered in a case of degenerating fibromyoma. The woman with the degenerating fibromyoma died on the second day.

The forty-one cases of ovarian tumor were made up of the following varieties: fifteen dermoid cysts, thirteen "cysts," four fibromata and "solid tumors,"

four "ovarian tumors," four carcinomata, and one sarcoma. The maternal deaths in the whole series numbered seven, the foetal deaths four, and the infant deaths one. In figuring the mortality it is not fair to include the five malignant tumors which accounted for two maternal deaths and one foetal death. In the thirty-six cases of benign tumors there were five maternal deaths, a mortality of 14 per cent.

Ten cases of tumors of the bony pelvis were as follows: three cases of osteoma of the pelvis, three of pelvic sarcoma, one of fibroma, one extraperitoneal cyst of the posterior pelvic wall, one tumor of the sacrum, and one sacro-iliac tumor. There were no maternal, foetal, or infant deaths. In five cases the labor was obstructed and in five it had not begun.

In the twenty-five cases of carcinoma of the cervix there were six maternal deaths, four stillbirths, and ten subsequent deaths of infants. In nine cases caesarean section was followed by radical abdominal panhysterectomy (Wertheim's operation); in one case the growth was in an early stage and radical operation was postponed; in the remaining fifteen cases the growth was inoperable. In the latter fifteen cases simple caesarean section was performed in six, and caesarean section followed by subtotal panhysterectomy in nine.

There were eight cases of carcinoma of the rectum and colon with no maternal deaths. Two children died later from prematurity. In one case colotomy was performed at the time of the operation, and in two cases colotomy had already been performed a few months previously. Labor was obstructed in five cases. Three patients were not in labor.

In eight cases of miscellaneous tumors there were no maternal deaths. In the one case of stillbirth a tumor in the anterior wall of the bladder had obstructed labor for three days; it was not removed. There was one case of obstructed labor due to a "four and one-half month's tubal abortion." In another case there were four unclassified pelvic tumors.

Alterations in the axis of the canal due to operations were present in thirteen cases of ventrofixation, two of ventrosuspension, one of Gilliam's operation, and three of the Schauta-Wertheim interposition. There was no maternal or foetal mortality, but four children (two of them twins) died later. In two of the ventrofixation cases there was also cicatricial contraction of the cervix due to previous amputation, and in one of these there was doubt as to whether the amputation of the cervix or the ventrofixation was responsible for the obstruction of labor.

There were four cases of narrowing due to vaginal and perineal operations. None of the mothers died.

In three cases of contraction or retraction rings there was no maternal death and only one foetal death.

In three cases of congenital malformations of the uterus and vagina there were no maternal or foetal deaths.

In nine cases of rigidity or stenosis of the cervix or vagina all the mothers and children lived.

Among the sixteen cases of excessive size of the foetus there was only one maternal death; the operation was undertaken as a last resort after the use of forceps, perforation, decapitation, and cleidotomy had failed to deliver the foetus.

In malpresentations the results were as follows:

1. Occipitoposterior presentation. In two cases the forceps had failed; both mothers lived and one child died after a few hours from cerebral hæmorrhage.

2. Brow presentation. All three women had been long in labor. One mother died (forceps had failed). One child lived and one had spina bifida and hydrocephalus. There is no record regarding the third.

3. Breech presentation. All of the mothers and infants lived.

4. Transverse presentation. Two of the five mothers died from general peritonitis, two of the foetuses were born dead, and one child died later. Four of the patients had been very long in labor and one had just begun labor. One death was that of a woman with tonic contraction of the uterus and impending rupture, and another that of a woman who had been in labor for four days.

There were four cases of hydrocephalus with no maternal mortality; forty cases of cardiac disease with a maternal mortality of nine (22.5 per cent); one still-born foetus, and six subsequent infantile deaths.

Representing other grave maternal diseases there were twenty-one cases with nine deaths.

In ten cases of previously repeated foetal death during labor, one mother died from subacute yellow atrophy of the liver and two children died.

In two cases of prolapse or presentation of the umbilical cord there was no maternal mortality. One child died.

In two cases of hydramnios both mothers and one child lived.

In one case of missed labor the mother lived. The foetus was macerated.

A summary of nine cases of ruptured uterus shows that two mothers died, five foetuses were born dead, and two children died later. The cause of the rupture was stated to be brow presentation in two, hydrocephalus in two, difficult forceps delivery in two, and contracted pelvis in one. For two, no cause was stated.

There were seventeen cases classed under miscellaneous indications. In this group there were no maternal or foetal deaths; the only child which died in the hospital was one delivered in a case of "pain due to adhesions following the removal of a suppurating appendix." E. L. CORNELL, M.D.

Banister, J. B.: *Cæsarean Section in Infected Cases of Obstructed Labor.* *J. Obst. & Gynæc. Brit. Emp.*, 1921, xxviii, 523.

Authorities do not agree regarding the justification for an immediate caesarean section in cases of

obstructed labor, especially in "septic" or "suspected" cases.

Routh reported that he found a maternal mortality of 34.7 per cent in cases in which infection might have been presumed before surgical methods were adopted. Consequently many authorities hold that some radical operation should be performed to minimize the risk of a fatal termination through sepsis. Banister believes that such a view is unnecessarily pessimistic, and puts forward his own experience to justify this opinion. He regards the classical operation as the best and safest under such circumstances. The modified technique adopted is as follows:

The vulva and vagina are first thoroughly swabbed out with antiseptic fluid with the patient under anæsthesia. The abdomen is then painted with the same fluid, and an incision of sufficient length to permit easy eversion is made. After this, a large towel is laid behind the everted uterus and drawn forward around the cervix to protect the peritoneal cavity from the liquor amnii. After the uterus has been emptied, the whole interior and the edges are swabbed with the antiseptic fluid, and the wound is closed according to the classical method. Saline solution is then poured over the uterus, the towel carefully removed, and the abdominal wound closed in layers without drainage. In the suturing, linen thread or silk has been used in all cases, but silkworm gut is even safer.

The author gives the history and notes of nine cases, all presumably "suspect" cases before operation. Many of the patients developed symptoms and signs of septic absorption, but the final result was good; several showed healing of the wound by first intention.

C. H. DAVIS, M.D.

Whitehouse, B.: Cæsarean Section in the Treatment of Placenta Prævia. *J. Obst. & Gynec. Brit. Emp.*, 1921, xxviii, 469.

After reviewing the subject of cæsarean section in the treatment of placenta prævia since the time of Tait, the author gives his own opinions formed from a careful study of the annual reports of the Birmingham Maternity Hospital for the last ten years and his personal experience.

At the Birmingham Maternity Hospital eleven methods of delivery were employed with the following results:

Method	Cases	Fœtal deaths		Maternal deaths	
		No.	Percent	No.	Percent
Version.....	211	193	91.4	9	4.2
Natural.....	35	16	45.7	0	0
De Ribes bag.....	15	11	73.3	3	20.0
Rupture of membranes..	11	9	81.8	0	0
Forceps.....	9	9	100.0	2	22.0
Cæsarean section.....	5	2	40.0	3	60.0
Vaginal cæsarean section	4	2	50.0	0	0
Induction.....	2	1	50.0	0	0
Extraction of breech....	2	1	50.0	0	0
Vaginal pack.....	1	0	0	0	0
Hysterectomy.....	1	1	100.0	1	100.0

The method of choice was version, but its fœtal mortality (91.4 per cent) is appalling.

In fact the fœtal and maternal mortality of the five most common methods of delivery, viz., version, natural, De Ribes bag, rupture of the membranes, and forceps, averaged 84.7 per cent and 4.9 per cent respectively. Furthermore, as placenta prævia accounted for 31.3 per cent of the total number of still-births occurring in this hospital during the ten years under consideration (715 in number), the problem of treatment is of considerable importance.

The first step to be taken to lower the mortality rates is early diagnosis. Every case of antepartum bleeding calls for a thorough examination. Furthermore, placenta prævia must be recognized, if possible, before bleeding becomes severe enough to endanger the viability of the fœtus.

The results of cæsarean section in placenta prævia have been most gratifying but there are many limitations to this form of treatment. Lateral or marginal placenta prævia does not usually call for this operation and certainly cæsarean section is not indicated after an initial severe hæmorrhage when the lives of both mother and child are threatened. The author reserves it for cases with symptoms from the eighth month of pregnancy and in which the first hæmorrhage has not been so severe as to endanger the viability of the child. Acting on these indications he operated upon nine cases of central and lateral placenta prævia during the last three years. All of the mothers recovered and eleven children were born alive although only nine survived. One infant died a few hours after birth and another seven days after delivery.

HARVEY B. MATTHEWS, M.D.

Kerr, J. M. M.: The Lower Uterine Segment Incision in Conservative Cæsarean Section. *J. Obst. & Gynec. Brit. Emp.*, 1921, xxviii, 475.

The purpose of this paper is to discuss the relative merits of the ordinary longitudinal incision through the body of the uterus and the incision through the lower uterine segment. The subject is taken up under the following heads:

1. Evidence that the uterine scar in the classical cæsarean section is often unsatisfactory.
2. Reasons for the defective cæsarean scar.
3. The means by which a better scar can be secured with the usual longitudinal cæsarean incision.

4. The lower uterine segment incision is the best incision because a stronger cicatrix results.

Under the first heading the statistical data collected by Holland is given as proof that the uterine scar after conservative cæsarean section is not as sound a scar as is generally supposed and frequently gives way completely or partially. Holland traced 1,103 women who had undergone cæsarean section and found that eighteen of 448 (4 per cent) had ruptured scars during subsequent pregnancies or labors.

The reasons why the uterine scar is so frequently defective include:

1. Difficulty in securing complete asepsis.
2. The fact that during the puerperium the fibers of the uterine muscle are in a state of degeneration (autolysis) which interferes very materially with the healing processes.
3. Difficulty in approximating the uterine wound whenever the uterus begins to contract.
4. Incomplete hæmostasis. Coaptation and hæmostasis must be accomplished by the same suture.
5. Implantation of the placenta on the anterior uterine wall. This occurs in 40 per cent of cases. Bleeding is apt to be excessive and the wound very difficult to suture.

The means by which a better scar can be secured in the usual longitudinal cæsarean incision are:

1. The prevention of infection by improved surgical technique and teamwork, prenatal care, and delivery of the placenta and membranes through the vagina.
2. The suturing of the uterine wound in layers.
3. The use of chromic catgut in the suturing of the mucous membrane, of linen or silk in the suturing of the muscle, and of catgut for peritonization of the uterine incision.
4. Suturing of the uterus while it is in a state of retraction as distinguished from that of contraction.

Pituitrin is contra-indicated as it causes very great difficulty in the suturing of the uterine wound.

The lower uterine segment incision is the author's choice because a firmer, better cicatrix results and therefore rupture is less apt to occur. The transverse lower uterine segment incision is advocated as it causes less bleeding; this part of the uterine wall is thinner and therefore easier to suture. A wound in this region is at rest during the early days of the puerperium, and as this portion of the uterus does not become fully stretched until labor is well advanced, the scar is in a safer location than the usual longitudinal scar.

The disadvantages of this operation are summarized as follows:

1. Technically it is more difficult to perform than the classical cæsarean section and therefore requires more time.
2. It is more apt to be associated with disturbing hæmorrhage if the incision is not carefully made.
3. It is quite difficult when there is little or no cervical dilatation.
4. Occasionally it is impossible to deliver the head through a transverse incision in the uterus. The author had one such case and was compelled to extend the incision longitudinally.

HARVEY B. MATTHEWS, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Levy, C. S. *Essential Hæmaturia; A Clinical Study.*
Surg., Gynec. & Obst., 1922, xxxiv, 22.

Essential or idiopathic hæmaturia is renal bleeding for which a cause cannot be determined. Pathologically the findings in such cases vary. A chronic passive congestion due to obstruction of the urine or blood, varices of the papillæ, congestion secondary to cardiac lesions, hæmophilia, angio-neurosis, ureteral stricture, and prenephritic conditions have all been described, but none of these could be the causative factor in all cases. In some instances the kidneys are apparently normal.

The diagnosis is always made by exclusion, and should be made only after all known urological tests have been found negative.

The author presents the findings in thirty cases diagnosed as essential hæmaturia from clinical studies and the replies to a questionnaire. The cases were followed for a period ranging from one month to thirteen years. A fair conclusion as to the sex incidence of the condition could not be drawn as most of the subjects were patients in a male urological clinic. In 36 per cent of the cases the onset of the hæmaturia occurred in the fourth decade of life. In the majority there were no other symptoms besides the hæmaturia. Nearly all of the cases developed spontaneously, and it appeared that exertion was of little importance as a causative factor. The kidneys were involved about equally but in no case were both of them affected.

Operative procedures consist of decapsulation, nephrotomy, and nephrectomy. The latter is indicated only as an emergency measure to prevent exsanguination. Non-operative measures are the methods of choice. These consist of the intrapelvic injection of silver nitrate and adrenalin, the passage of the ureteral catheter, the oral administration of calcium lactate, and subcutaneous or intramuscular injections of horse serum. Preference is given the intrapelvic methods. When these are employed the kidney pelvis should be completely distended.

Of the author's thirty patients, twelve have had no recurrences of the hæmaturia, while eighteen have had subsequent attacks. Spontaneous cessation of bleeding occurs not infrequently, and the general health is usually unaffected. Analysis of the questionnaires led to the inference that none of the patients has developed nephritis, renal or ureteral calculus, tuberculosis, or renal tumor, and none has had an operation on the genito-urinary tract. In spite of the loss of blood and recurrences, the prognosis is favorable.

Several interesting tables are included in the report.

N. K. FORSTER, M.D.

Rosenow, E. C., and Meisser, J. G.: *Nephritis and Urinary Calculi After the Production of Chronic Foci of Infection: Preliminary Report.* *J. Am. M. Ass.*, 1922, lxxviii, 266.

During the course of numerous experiments on the localization of bacteria from various diseases, instances of extremely specific effects were noted. Some of these observations suggested that urinary calculi may be due to prolonged low-grade infection by bacteria having elective affinity for the urinary tract and the power to cause the precipitation of calcium.

Accordingly, teeth in dogs were devitalized and infected with cultures of streptococcus freshly isolated from the urine of a patient suffering from nephrolithiasis. Five of the dogs developed calculi. The sixth died too soon for stones to form. In four dogs calculi were found in both kidneys. The size varied from small concretions to stones measuring 3 by 7 mm. and was roughly proportional to the duration of the experiment. The findings in these dogs resembled those in patients with nephrolithiasis. The stones were hard, angular, and rough, and of a chemical composition similar to that of the stones formed in nephrolithiasis in man. The evidence of infection of the urinary tract and the lesions in the kidney were slight except when obstruction in the ureter had been caused by an impacted stone.

The causal relationship between the calculi and the streptococcus inoculated into the teeth seems established. The organism was isolated from the kidneys, from some of the stones, and from the teeth of the dogs, and its elective affinity for the medulla of the kidneys of rabbits on intravenous injection was demonstrated. The organism was found in the lesions of collecting tubules where crystallization and stone formation were beginning. Precipitation and crystallization of calcium always occurred in areas with little or no cellular reaction.

Stone was not developed by any of the four dogs whose teeth were infected with streptococci isolated from patients with arthritis or any of the four additional control dogs which were kept under the same conditions, but whose teeth were not infected. The urine of all of these eight dogs remained normal and the kidneys showed no focal lesions.

Stones of the character obtained in these experiments were not found in another series of fourteen dogs which were kept under similar conditions and whose teeth were devitalized and infected with strains other than those from nephrolithiasis and nephritis, nor in a single instance in the examination of more than five hundred dogs used for other experiments.

It is not clear why four dogs which were infected with the streptococcus of arthritis failed to develop

arthritis. There was active infection around the teeth in all instances, and the staphylococcus from the pulp chamber in one of the dogs inoculated four months previously retained its affinity for the joints of rabbits on intravenous injection. It would seem, therefore, that the joints of these dogs were not affected because of the high resistance of these structures to invasion by this organism during the relatively short duration of the experiment, and not because of encapsulation or loss of specific localizing power.

Aside from being the source of the organisms which localized electively, the experimentally produced foci of infection appeared to have a marked general deleterious effect. The dogs lost decidedly in weight, lost much hair, and became susceptible to intercurrent infection. At the end of the experiments an active process was found in the devitalized and infected teeth. The findings around the teeth were similar to those following the artificial devitalization of teeth in man. The infected teeth became discolored but remained firmly in place in the alveolar sockets; the infection caused rarefaction and absorption of bone in the peri-apical region without swelling, pain, or tenderness. The character of the cellular infiltration and the distribution of the bacteria of well-formed granulomata were strikingly similar.

Barney, J. D.: Recurrent Renal Calculi. *Boston M. & S. J.*, 1922, clxxxvi, 9.

Barney has reviewed 139 case reports of renal stones obtained from the records of the Genito-Urinary Department of the Massachusetts General Hospital. He finds that the male shows a greater predisposition to renal calculi than the female. The exceedingly low mortality is explained by the fact that as a rule persons with renal stones have excellent health and nearly all are in the prime of life. Only eleven of those studied by Barney were over 50 years of age, the majority being between 21 and 39.

Attention is called to the fact that many intra-abdominal conditions simulate renal calculus and that in some instances the best surgeons err. In a previous study Barney found that 18 per cent of patients with renal stone had had some previous abdominal operation, as a rule an appendectomy. In many of the cases cited the well-known diagnostic measures were not used. It is sometimes very difficult to make a differential diagnosis between acute infection in the right side of the abdomen and renal stones as frequently both the urine and the X-ray findings are negative.

In Barney's opinion, an exploration, especially of the appendix, is sometimes necessary. By such an exploration the surgeon may guard the patient against rupture of an undiagnosed appendicitis. In the chronic conditions, however, no excuse can be offered for operation on the appendix when a renal stone is present, especially if the symptoms have been present for years.

In reviewing his case reports Barney was impressed with the mildness and the duration of symptoms presented in many instances. In four cases the symptoms had been present for less than a week; in nine, for two months; in eighteen, for six months; and in eight, for a year. In thirty-nine cases they had been present for three years; in eleven, for five years; in fourteen, for ten years; and in seventeen, for a "number of years." Renal stone may be most insidious and may acquire an enormous size without causing noteworthy symptoms.

Barney found that small stones produce symptoms more frequently and more severe symptoms than large stones. The most common symptom is pain. It must be borne in mind, however, that pain radiation may be to any other organ in the abdomen or to any other part of the abdomen—in some instances to the kidney on the opposite side. Barney finds that the first indications of stone in the urinary tract may be hæmaturia, dysuria, chills, and fever, frequent urination, and sometimes retention.

Tenderness was found in only 43 per cent of the cases. Pus was the most frequent element in the urinary sediment. It was found alone fifty-nine times and with blood forty-one times. Blood was found alone twenty-six times. In twelve cases (8.6 per cent) the urine was persistently negative.

Our present-day acumen in the diagnosis of stone is due largely to the X-ray. Ordinary clinical methods of observation by themselves are of little value and in some instances, even when combined with the use of the cystoscope and ureteral catheter, give little help in the diagnosis. Barney found a positive X-ray picture in 125 instances, but in 6 to 11 per cent the roentgenogram fails to show stone shadows. As superimposed stones may throw a single shadow, a search should always be made for more than one stone.

Although cystoscopy with catheterization may be of little value when used alone, it is a procedure which is essential as by means of it the presence of two kidneys may be ascertained, it gives correct information concerning infection of the kidney, determines the patency of the ureter, reveals the separate function of each kidney, and makes possible the localization of a shadow suggesting stone as extrarenal or intrarenal. In addition, a pyelogram may be made which will show the amount of dilatation of the kidney pelvis, etc. An experienced roentgenologist is necessary not only to make the plates, but also to interpret them.

Renal stones were found to be bilateral in 6.4 per cent of the series of cases studied. Bilateral stones do not necessarily cause bilateral symptoms. In twenty-four instances the only stone or one of several passed spontaneously, generally after a cystoscopic examination. When stones were not passed spontaneously, operation was performed. Pyelotomy, the operation of choice, was done in sixty-four instances and pyelotomy and nephrotomy were done thirteen times. There were thirty-nine nephrectomies and seventeen nephrotomies, three of which were bilateral.

In the author's experience, pyelotomy is sufficient for the removal of small calculi, even when they are multiple. Nephrotomy is necessary only when the stone is of such size and shape as to make its extraction through the renal pelvis impossible. Nephrectomy was done when the kidney was badly infected and harbored a very large stone or many small ones. Postoperative complications found by Barney were various in character and cause, the list including exacerbation of pre-existing infections requiring nephrectomy and hæmorrhage after nephrectomy.

The mortality from multiple stones was 3.5 per cent, which the author considers not discouraging. Two of the deaths were due to pneumonia, one to uræmia, one to hæmorrhage after nephrotomy, and one to gas-oxygen anaesthesia.

Abnormalities of the kidneys were found in five instances: horseshoe kidney in three and an aberrant artery in two. None of these abnormalities was discovered before operation.

Barney states that a review of the results of operation for renal calculus is not inspiring. The number of patients in whom subsequent examinations showed the presence of one or more calculi is appalling. Although conditions which produce stone are not removed when the stone is extracted, it is Barney's opinion that whatever operation is done it often does not remove all the stones. To prove this statement he cites the fact that of twenty of his patients who were X-rayed during convalescence, nine (45 per cent) still showed stones and that in 50 per cent of those who were subjected to pyelotomy stones were subsequently found in the kidney.

All patients should be X-rayed during convalescence because if a stone is revealed by the X-ray six months or a year after operation it is impossible to tell whether it was left at operation or is a recurrence. Although an X-ray examination was not made soon after operation in most instances, Barney found what was believed to be a recurrence in 32.8 per cent of the cases in which a pyelotomy was done.

Following nephrotomy, recurrences were found in 56 per cent of the cases by Cabot and Crabtree and in 30.3 per cent by Barney.

Barney studied seventy cases treated by nephrotomy at the Massachusetts General Hospital from 1897 to date. The ages of the patients ranged from 11 to 64 years. The operative mortality was 5.7 per cent. Recurrence or overlooked stones were found in 52.9 per cent of the cases. This fact and the ever-present danger of hæmorrhage indicate that the operation is not always successful.

The author writes at some length concerning the difficulty of controlling hæmorrhage and the surgical judgment which is necessary to determine when a nephrectomy is necessary to arrest it.

After reviewing the situation from the point of view of both pyelotomy and nephrotomy, Barney states the reasons why the removal of stones from the renal pelvis is not always possible as follows:

1. The renal pelvis is a very complex cavity with various ramifications in the form of calyces. Calyces may branch at right or acute angles from the plane of the pelvis. A probe may fail to find the orifice of the calyx either because of its minute size or because of its location. In either event, a stone remains undetected.

2. One may see a very definite shadow of what is apparently one stone in the kidney and at operation may remove a stone which resembles the X-ray shadow in size and shape and still leave other stones in the pelvis because the pelvis was not thoroughly explored.

3. The manipulation required to remove a stone, even though gently performed, produces hæmorrhage which may cover the remaining stone with a layer of fibrin so that it cannot be detected with a metal instrument.

4. Frequently unsuspected stones may slip into a dilated ureter during the operation on the pelvis.

Pre-operative study and localization of the stone shadows are absolutely necessary. The location and number of stones within the kidney must be determined. An X-ray examination should be made as close as possible to the time of operation, preferably the same day. Pyelograms should be made.

The utmost care should be taken to prevent bleeding.

Needling at the suspected location of a stone is very helpful.

Caulk's method of tapping the kidney gently to shake a stone out of the calyx into the pelvic cavity is of some value.

Great care should always be taken in removing a stone in order not to break it. If a small piece is broken off or allowed to remain, the pelvis should be thoroughly irrigated with hot salt solution.

The use of the fluoroscope in conjunction with operation may reveal small bits of stone remaining in the kidney.

Barney's experience with renal stone and his studies of the records of the hospital and the literature have convinced him that there are instances in which it is impossible to remove all stones from the kidney. He believes, however, that the number of failures will be reduced in direct proportion to the care that is taken before and during the operation.

The article is concluded with the statement that in spite of the high percentage of recurrences, the patient should be urged to submit to operation as a stone will insidiously but surely cause damage to the kidney.

GILBERT J. THOMAS, M.D.

Lockwood, C. D.: Nephrectomy in Hunchbacks; With Report of Two Cases. *California State J. M.*, 1922, xx, 29.

In performing nephrectomy in the case of a hunchback, Lockwood overcomes the difficulties by using a combined outer rectus incision and a transverse incision following the lower border of the ribs as far as possible. The overhanging ribs are then lifted upward by broad powerful retractors.

The retroperitoneum is slit, the ureter ligated, and the kidney dislocated toward the median line. The renal vessels are clamped and divided. Special difficulty is encountered in ligating the vessels as this step in the operation, as well as the others, is done almost entirely by touch. If drainage is indicated, it is best secured by means of a retroperitoneal stab wound between the ribs.

LOUIS GROSS, M.D.

BLADDER, URETHRA, AND PENIS

Caulk, J. R.: Contracture of the Vesical Neck in the Female. *J. Urol.*, 1921, vi, 341.

Caulk believes that trigonitis rarely ever exists alone in the female, but is co-existent with a urethritis which, of the two, is the more important lesion. Chronic infections are quite common in the female urethra because of its exposure to infection and trauma. In the author's hands the cure of the trigonitis has been dependent upon the treatment of the urethra, particularly dilatation.

For the symptoms of so-called "prostatism," which are due largely to the infiltrating process involving the internal sphincter and intra-sphincteric glands, with resulting contraction of the vesical neck, Caulk advises the removal of a large bit of tissue from the median portion of the vesical neck by means of the cautery punch. In this connection he cites a well-developed case in which this method gave relief after the condition had resisted treatment for several years.

ALBERT W. HOLMAN, M.D.

Herbst, R. H., and Thompson, A.: Adenocarcinoma of the Bladder. *Am. J. Surg.*, 1922, xxxvi, 4.

The authors' patient, a man 55 years of age, had had increasing hæmaturia, frequency and difficulty in urination, and pain in the lower abdomen and rectum for eight months. He was anæmic and had lost weight and strength. Cystoscopy showed a mass which appeared to involve the anterior wall of the bladder.

On suprapubic cystotomy a tumor about the size of a small pear and attached by a thin pedicle to the posterolateral wall of the bladder about 2 cm. from the internal urethral orifice was seen projecting from the fundus. This growth was removed. No evidence of infiltration in the bladder wall and no other tumors in the bladder were discovered.

On section of the tumor no cysts but several areas of marked softening were found. Many regions presented a glistening appearance with alternating areas of an opaque and a clear substance.

Microscopic examination showed the growth to be composed of densely packed alveoli of varying size. There was extensive mucous degeneration of the larger cells. The appearance of the tumor indicated that it had its origin in glandular epithelial structures rather than ordinary bladder epithelium.

Glandular tumors of the bladder are quite rare and there has been much speculation concerning

their origin. They have been regarded as glands derived from the prostatic urethra, simple glands found normally both in the trigone and throughout the bladder wall, cells cut off from the rectal mucous membrane during embryonic development and lodged in the bladder wall, aberrant urethral glands, cells derived from the allantois, glandular neoformations of the bladder mucosa, invaginated tubules in cystitis cystica lined by cylindrical cells developing secretory tendencies, and metaplasias of the bladder epithelium into cylindrical-celled epithelium with goblet cells.

The cases of adenocarcinoma of the bladder reported conform to the same general type microscopically but are variable in their gross characteristics. Such tumors have been found in the trigone, the fundus, the posterior wall of the bladder, about the urethral orifice, covering the whole bladder wall, within the bladder wall, and in exstrophy of the bladder.

Both clinically and from their microscopic characteristics they seem to be very malignant. Recurrences have developed in the bladder and metastases have been found in the retroperitoneal and mesenteric lymph nodes, the abdominal wall, and abdominal viscera.

The diagnosis is usually made after operation from stained sections and from an accumulation of mucus noticed in some cases when the freshly removed specimen is split.

The authors' case differs from other reported cases in that the tumor was attached to the bladder wall by a thin pedicle and there appeared to be very little, if any, involvement of the bladder wall, the neoplasm growing out of the bladder wall rather than in it.

A few weeks after the operation cystoscopic examination showed slight thickening of the bladder wall at the former site of the tumor. This had the appearance of œdema rather than of infiltration. Radium was applied. One month later the area had decreased in size. At the present time the patient shows no evidence of metastases, has gained in weight and strength, and has no symptoms.

The treatment of these tumors is obviously surgical treatment supplemented by some form of irradiation. The mode of attack depends on the extent and location of the growth and the presence or absence of metastases.

In practically all the reported cases the growth has been excised, but in most instances without permanent benefit. Excision alone has not proved entirely successful, but there seems to be justification for the belief that future recurrences can be minimized or possibly even prevented by the application of radium.

Venot, A., and Parcelier, A.: Cancer of the Female Urethra (Le cancer de l'urètre chez la femme). *Rev. de chir.*, Par., 1921, xl, 565.

The authors give the histories of eighty-seven cases collected from the literature and one case of their own.

In 1903 Percy made a critical review of all cases published up to that time but concluded that only twelve were true cases of urethral malignancy and three of these were cases of sarcoma. Riberi has always been credited with reporting the first case of cancer of the female urethra in 1844, but Venot and Parcelier agree with Percy that Bowin reported the first case in 1833.

Although malignant tumors in general are more frequent between the fourth and sixth decades of life, urethral cancer has been found in young women. Almost all those so affected have had at least one pregnancy.

Percy excluded from his cases of urethral cancer all those with involvement of anatomical structures other than the urethra. The literature contains the reports of only fourteen cases in which, at the time of the first examination, the urethra alone was involved, but in the majority the original limits were greatly exceeded in the later stages.

With certain reservations, the authors accept the classification of Ehrendorfer: (1) urethral cancers having their origin in the urethral epithelium or its glands; and (2) vulvo-urethral cancers having their origin in the epithelium which surrounds the meatus (vestibule) and invading the urethra secondarily. The vulvo-urethral type includes: (1) the polyp or papillary form; (2) the ulcerous form; and (3) the infiltrating form. The urethral type comprises: (1) an ulcerous form, and (2) an infiltrating form.

Gland involvement is found in about one-third of the cases. Metastases were discovered in only two of the reported cases. The diagnosis of a urethral polyp must be based on a histologic examination, but in the great majority of cases the picture of cancer of the urethra is sufficiently definite to prevent confusion.

It is generally agreed that the prognosis is grave. Epithelioma of the urethra and the malignant degeneration of urethral polyps are among the most malignant cancers.

The surgical treatment of urethral cancer includes several types of operation:

1. Partial resection of the urethra. Twenty-eight cases were treated in this manner without any operative deaths and with a good functional result in the majority.

2. Total resection of the urethra. This operation usually means the removal of the entire urethro-vaginal wall. It is completed by vaginal or suprapubic drainage of the bladder. The literature reports twenty-two cases in which a vaginal stoma and eight cases in which a suprapubic stoma was made. Continence after the operation was obtained in only twelve cases.

3. Resection of the urethra and removal of the inguinal glands. In ten cases treated in this manner a partial resection was done in four and a total resection in six. In a few cases the patient's condition necessitated a two-stage operation, the removal of the glands being done several months after the removal of the urethra.

Recurrence is frequent. It developed in nine of twenty-eight cases in which partial resection was done and in five of the cases of total resection.

In fifty cases collected by Crossen, in which the end-result was known, there were twenty-five radical operations, only eight of which were followed by recovery lasting for more than three years. The authors, however, have found some cases in which survival was much longer, especially following total resection.

In a few cases of urethral cancer reported in the literature radium was used with exceptionally good results.

W. A. BRENNAN.

GENITAL ORGANS

MacKenzie, D. W.: Pseudohermaphroditismus Masculinus Internus; Congenital Malformation in the Scrotum, Two Testes and a Uterus in the Right Portion of the Scrotum. *Surg., Gynec. & Obst.*, 1922, xxxiv, 51.

MacKenzie reports the case of a male, 38 years old, who had a painful mass in the right groin which has been present as long as he could recall, but during the last four days had markedly increased in size and had become painful.

The left scrotum was small and contained no testicle; the right scrotum was large and contained two round masses and an irregular mass in the center which extended well up the inguinal canal.

At operation the mass was found to consist of two moderately sized testicles in the right scrotum and a large mass between which extended up the canal and down the course of the vas. One testicle and the mass were freed and removed.

The testicle removed had normal tubules and spermatozoa. The oblong mass was found to be an infantile uterus with a single fallopian tube. A cord-like structure on the posterior aspect of the uterus was found on section to be the vas deferens which led down to a mass near the uterine fundus that proved to be the epididymis.

The literature contains the reports of twenty-six very similar cases and others of the same embryological genesis. All of the patients had strong masculine characteristics. Only a small number had children. In one-fourth of the cases the uterus was double. When single, it was usually atrophied. The testicles were normal in only a few instances; usually they were atrophied and degenerated. The uterus continued into a vagina which opened into the posterior urethra.

Hermaphroditism is of two types:

1. True hermaphroditism in which the individual is bisexual and has both testicles and ovaries.

2. Pseudohermaphroditism, which is subdivided into the masculine and feminine types in which one group of sex organs is complete and is associated with an incomplete set of sexual organs of the opposite sex but without sex glands (ovary or testes).

Up to 1908, 910 cases had been reported. Seven hundred and twenty-two of these were of the masculine type.

MacKenzie discusses at some length the embryological development of the sex organs of both sexes and the abnormal embryological development necessary to bring about the various types of hermaphroditism.

HARRY CULVER, M.D.

Hinman, F.: Suprapubic Versus Perineal Prostatectomy: A Comparative Study of Ninety Perineal and Thirty-Eight Suprapubic Cases. *J. Urol.*, 1921, vi, 417.

The author states that since the suprapubic prostatectomy enjoys greater general favor than the perineal prostatectomy, the few men still employing the perineal route must justify their course by a detailed presentation of their results. In order to evaluate the results of the two operations correctly, he compares thirty-eight cases of suprapubic prostatectomy with ninety cases of perineal prostatectomy which were operated upon by the same surgeon under the same general conditions of pre-operative and postoperative care. The results are carefully analyzed and the details presented in a comprehensive series of tables. On the basis of this study Hinman makes the following statement:

"It seems logical to conclude that in our hands Young's method of perineal prostatectomy is

superior to the Fuller-Freyer method of suprapubic prostatectomy. The general results are much better than those obtained suprapubically."

H. A. FOWLER, M.D.

MISCELLANEOUS

Roth, L. J.: Urinary Pus-Cell Count. *California State J. M.*, 1922, xx, 5.

Roth has adopted the following method as a more or less accurate diagnostic and prognostic aid:

The fresh specimen of urine is thoroughly shaken and a portion drawn into a red-cell pipette and agitated. A Thoma-Zeiss counting chamber is then filled with the fluid as in the method used to count blood cells. The eye-piece of the microscope is adjusted so that the diameter of the field is eight small squares. One hundred fields are then counted, the ruling of the counting chamber being disregarded. The resulting number multiplied by .7957728 will give the number of pus cells in 1 c. mm.

As a control in the count following prostatic massage the bladder is thoroughly irrigated and then filled with 100 c. cm. of a mild antiseptic solution. This is voided after massage and the count made with this 100 c. cm. as a standard quantity.

LOUIS GROSS, M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Syme, W. S.: *Malignant Disease of the Throat.*
Canadian M. Ass. J., 1921, xi, 887.

Syme believes that malignant disease of the throat is a field for the laryngologist and not for the general surgeon because the former is better acquainted with the improved methods of examination, including the direct methods, and hence is better acquainted with the anatomy of the parts.

In any suspicious case, viz., cases of hoarseness persisting for two weeks, difficulty in swallowing, particularly if associated with loss of weight, pain on swallowing, and cough, a thorough examination with the aid of all known methods is demanded. Examination by the reflected light of the laryngeal mirror and direct examination with the suspension laryngoscope and the tubes are indicated.

For examining the nasopharynx Syme prefers Yankauer's speculum. In dealing with growths in the pharynx and larynx he prefers the suspension method, but others employ the tubes. When either is used a portion of the growth should be removed and its extent and mobility determined.

Examination by means of the X-rays sometimes gives important information, and examination of glandular involvement is essential before the question of operation and its extent can be determined. Not only the cervical glands but those in the mediastinum must be considered. The latter will cause pressure on the bronchi or veins and the recurrent nerves.

Thyrotomy is useful in intrinsic disease of the larynx, and laryngectomy when the disease has progressed beyond the confines of the larynx and the very upper part of the trachea but has not extended into the food passages. In laryngectomy it must be possible to divide the trachea well below the larynx and yet leave sufficient tissue to bring forward to attach to the skin.

The alternatives to total removal are the methods in which Trotter of London has been a pioneer. These procedures aim to remove the growth without breaking the continuity of the food and air passages. What Semon did in the way of limiting operative procedures for intrinsic carcinoma of the larynx, surgeons like Trotter are doing in regard to malignant disease of the pharynx and the extrinsic portions of the larynx. The operative methods are adapted to growths in different parts of the pharynx. Tracheotomy is performed several days previously or at the time of the major operation. The pharynx is then packed. There are two distinct stages in the operation, the exposure of the growth and its removal. In some cases a third stage is necessary when a plastic procedure is required to restore the

wall of the food passage and to safeguard the opening into the larynx when a part of the œsophagus has been sacrificed.

The incision extends along the anterior border of the sternomastoid muscle practically from the tip of the mastoid to the clavicle. If the growth is in the lower part of the pharynx it need not begin so high up, and if it is in the upper part it need not go so far down. The dissection is carried down to the constrictor muscles of the pharynx and to the wing of the thyroid, the muscles attached to the latter being divided. The sheath of the large vessels is then determined, and to minimize the risk of septic infection passing along it and the danger of subsequent serious and even fatal hæmorrhage from ulceration of the vessel walls, the vessels are shut off from the operation cavity by stitching the anterior border of the sternomastoid to the aponeurosis in front of the spine.

If the growth is in the lower pharynx or in the wall of the larynx, the wing of the thyroid cartilage is then removed and a vertical incision is made through the constrictor muscles to expose the mucous membrane. If the growth involves the pharyngeal wall it may be possible to outline it before opening the pharynx. A careful examination is made to determine the extent of the growth and whether it is still confined to the mucous membrane or has passed beyond the cavity of the pharynx and invaded the adjacent structures. However detailed and careful the preliminary examination, it is in many cases impossible to determine before operation the whole extent of the involvement.

The pharynx is opened by a vertical incision passing, if possible, through the uninvaded mucosa. Again a careful examination is made. The larynx can be easily rotated to examine its posterior surface. Even at this stage the advisability of proceeding with the operation must be considered again. Further surgical steps are adapted to the conditions found, the rule being to cut wide of the disease (and this applies to the larynx as well as the pharynx), taking special care not to make an accidental perforation of the posterior wall of the larynx or trachea when the position of the disease might make this possible. If there is glandular or other involvement, the operation is extended.

Then comes the examination of what remains. Two all-important questions call for answer: Has it been possible to preserve the continuity of the food passage, and has the removal of the portion of larynx been so limited that it is possible to safeguard its opening? If it has been necessary to remove the lower pharyngeal wall in its whole circumference, the œsophagus must be anchored to the skin, though it may be possible later to restore

the continuity of the food passage. If a sufficient and continuous portion of the wall remains, the anterior flap of skin is turned in and attached to the cut edges. A rubber tube is then passed through the nose into the stomach. Later, when the skin flap has become united with the pharyngeal wall, it is separated from its original attachment and turned in to complete the restoration of the pharynx. This part of the operation is by no means easy and the resulting fistula is overcome only with difficulty.

It is in regard to the larynx, however, that the chief difficulty arises. Trotter endeavors to overcome it by stitching up the larynx under the root of the tongue so that when the tongue arches in swallowing the upper opening is covered. The great value of maintaining the windpipe for speech, however hoarse or raucous, gives this part of the problem supreme importance. Then, also, the complete removal of the larynx may make it impossible to restore the continuity of the pharynx when an extensive removal of its wall has been part of the operation.

If the region of the tonsil pillars or root of the tongue is the part involved, another incision is made joining the incision along the sternomastoid from the tip of the mastoid to the chin. The triangular flap thus made is turned downward and forward, the jaw is divided in front of the masseter muscles, and the two halves are forcibly retracted. In this way a particularly good exposure of the tonsillar region is obtained.

For growths involving the epiglottis a transhyoid incision is sometimes recommended.

OTTO M. ROTT, M.D.

MOUTH

Pimienta, A.: Vulcanite Restoration of a Receding Upper Jaw. *Dental Cosmos*, 1922, lxiv, 71.

The case reported was that of a man about 40 years of age whose upper jaw receded to such an extent that the lower incisors extended about $\frac{1}{2}$ in. in front of the upper incisors. All of the molars, both upper and lower, had been extracted. When the mouth was closed the upper incisors came in contact with the floor of the mouth just posterior to the base of the alveolar process. This condition rendered mastication of solid food impossible. The patient was wearing a partial denture of gold in the upper jaw and a bar denture with rubber attachment in the lower jaw. There was no articulation.

The author made a denture for the upper jaw. The artificial teeth were arranged to articulate with the protruding lower ones, and the upper natural teeth were allowed to pass through an opening in the denture itself and were covered by a screen of rubber which was bent backward to give the appearance of a tongue. The denture was held in place by clamping it on each side to the natural teeth. Sufficient wax was added to it to round out the face.

The result was very satisfactory and the patient was able to masticate solid food.

MARGARET I. MALONEY.

Hartzell, T. B.: When to Extract and When to Conserve Diseased Teeth. *Dental Cosmos*, 1922, lxiv, 43.

When the X-ray shows no bony disease, when evidence of pathologic change cannot be elicited by palpation of the soft tissues over the root ends or by percussion of the teeth themselves with steel instruments, and when the patient is otherwise well physically, one is justified in allowing the pulpless teeth to remain. The extraction of such teeth is justified only by positive evidence that they are the source of an injurious bacterial invasion. In order to demonstrate this fact a careful examination of the patient's blood is helpful. If by exclusion all other sources of infection can be eliminated and there is an increased leucocyte count associated with a secondary anemia, the conclusion may be drawn that bacterial invasion is going on and that the danger is sufficient to justify extraction. On the other hand, the blood examination may reveal a diminished number of leucocytes. In a case presenting a leucocyte count of 6,500 or less, an increased proportion of lymphocytes over phagocytes, and a secondary anemia, a positive warning is given that the patient is in serious danger and the extraction should be performed as soon as he can tolerate surgical interference. In such a case only a very limited number of teeth should be extracted at a sitting. If many were removed the body would be unable to combat the large numbers of bacteria thrown into the blood stream by the extraction because of the decrease in the number of leucocytes.

The examination of the urine should not be neglected. The presence of casts, albumin, sugar, or red blood cells indicates grave conditions which must always have a direct bearing on the conservation or destruction of pulpless teeth, particularly if such teeth present radiographic evidence of deep pyorrhœa pockets or granulomatous root ends.

If in the general examination a patient presents evidence of secondary infection but an increased leucocyte count, operation should be performed and should be done with greater rapidity than when the leucocyte count is decreased.

MARGARET I. MALONEY.

McGauley, W. G., and McGauley, F. H.: Epilepsy: Due to Unerupted and Impacted Molars. *Dental Cosmos*, 1922, lxiv, 30.

The authors report the case of a boy, 15 years old, who had been subject to epileptic fits for two years. Repeated examinations failed to reveal the cause. On April 12 the patient experienced a dull feeling on the left side of the face, which was followed by a sudden trembling of the jaws and unconsciousness for three-quarters of an hour. On April 14 he had the same peculiar sensation again on the left side of the lower jaw. He was then taken to the dispensary where he was advised to have the second molar tooth extracted, although it was in perfect condition. He then consulted a dentist who advised him not to have the tooth extracted. Another dentist

advised a radiographic examination. The radiograph disclosed a partially developed and unerupted third molar in the left lower jaw. The Wassermann examination was negative.

The patient was anesthetized with ether, iodine was applied posterior to the second molar over the operative field, an incision was made, and the tooth removed. The cavity was then thoroughly swabbed with tincture of iodine and a small piece of iodoform gauze was placed in the opening and allowed to remain there for twenty-four hours. Healing occurred normally. There was no recurrence of the twitching of the facial muscles until April 21 when the patient returned for examination stating that he had experienced the same peculiar pain in the right side of the face but no recurrence of the epilepsy.

Radiographic examination of the right side revealed a condition similar to that which was found on the left side. Therefore on April 23 the right side was operated upon in the same way. Healing again occurred normally.

On July 15, when the patient reported for examination, he was improved in appearance and condition and had had no epileptiform attacks or convulsions since the removal of the third molars.

MARGARET I. MALONEY.

Arnone, L.: On the Therapeutic Action of the X-Rays in Diseases of the Oral Cavity. *Dental Cosmos*, 1922, lxiv, 73.

Arnone's first patient was an army officer who returned from war with a serious form of trench-mouth. Hygienic treatment, attention to general hygiene, the most scrupulous cleanliness, and the electric cautery afforded only temporary relief. The X-ray was finally used as advised by Posch.

The first application was of ten minutes' duration with an interval of five minutes to rest the mouth. The gums immediately became paler and the patient noticed a sensation of dryness and heat. Other applications were given at three-day intervals. At the fourth sitting the improvement was such that all bleeding and discomfort had ceased completely and there was no offensive odor from the mouth. After the sixth application, twenty days after the first sitting, all raw surfaces had healed and the gums had resumed their normal aspect. After a month and a half, when the X-ray applications had been suspended, regeneration of the gum tissue, which had receded from 3 to 4 mm., took place.

In a second case four applications of ten minutes each were sufficient to relieve all turgidity and discomfort of the gums and to cause the disappearance of mucopus.

After experimenting for six months the author is convinced that diseases of the mouth open up a new therapeutic field for the X-rays and that excellent results may be expected. He believes that if the necessary precautions are taken and the methods suggested by Coen-Cagli are followed, all danger may be avoided.

The work is still in the experimental stage and as yet no definite conclusions can be drawn. However, when the disease has just begun and the patient is young, one may be sure of 100 per cent cures. Following the extraction or loss of teeth in the cases of old persons with pyorrhœa the alveolus often remains open and the gums are tender and do not adhere to the bone. In such cases the X-rays stimulate the periosteum and cause rapid cicatrization of the wound. In hæmorrhagic gingivitis they have an excellent hæmostatic effect.

MARGARET I. MALONEY.

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INTERNATIONAL ABSTRACT OF SURGERY

JUNE, 1922

COLLECTIVE REVIEW

THE SO-CALLED ESSENTIAL UNILATERAL HÆMATURIA

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THE more common causes of bleeding from a single kidney are usually demonstrable.

Kretschmer (1), for example, observed the phenomenon in seventy-three cases including twenty-three cases of renal tuberculosis, twelve of nephritis, eight of renal calculus, eight of hypernephroma, eight of colon-bacillus infection, two of renal tumor, two of polycystic disease, two of trauma, two of hydronephrosis, two of renal carcinoma, one of pyonephrosis, one of movable kidney, one of doubtful stone, and one of oxaluria. In twenty-eight cases observed by Chute (2) the renal pathology was divided as follows: hypernephroma eight, nephritis seven, renal tuberculosis five, calculus four, hydronephrosis three, and polycystic kidney one.

Unilateral hæmaturia of the so-called essential type, however, is the subject of much conjecture. Young (3) states that the first case of varicose veins of a papilla was demonstrated in 1898. Fenwick (4), in 1904, found varicosities of a papilla in six instances in which he opened the pelves of bleeding kidneys. Dowd (5), Myles (6), Kretschmer, Pilcher (7), Braasch (8), MacGowan (9), Bunts (10), Whitney (11), Newman (12), Cabot (13), Payne and Ballenger (14), and Rytina (15) have since encountered the same condition.

In this connection Payne and MacNider (16) describe the microscopic findings in three cases of nephrectomy as consisting of "few if any changes in the cortex, a marked overgrowth of chronic inflammatory tissue in the medulla and pyramids which surrounded the vessels of this zone, and these vessels, in turn, dilated and resembling vari-

cosities." The overgrowth of connective tissue in the papillæ and at the cortico-medullary junction interfered with the venous return, thereby producing varicosities and actual hæmorrhage from the papillæ. Braasch reminds us that clamping of the kidney pedicle at operation gives the appearance of varicosity and therefore the diagnosis of renal varix is not positive without microscopic confirmation.

Quimby (17) examined two kidneys which had been removed because of persistent hæmaturia. Macroscopically both organs appeared normal. Microscopic examination showed the parenchyma to be normal but revealed hæmorrhage just beneath the epithelium of the pelvis and to a less extent in the substance of the papilla itself in both. In one there was no evidence of inflammation, but vascular distention, rupture, and hæmorrhage were found, the latter due to mechanical rupture or injury of the thin-walled vessels by some injurious circulating agent. In the other case inflammatory changes were present but there were no evidences of bacteria although they might have been present within the lesions. Certainly some local injurious agent was present.

Wulff (18) in one instance discovered microscopically the presence of red blood cells between the tuft and the wall in the glomerule without evidences of nephritis, and Gunn (19) found severe interstitial changes in an excised kidney. Young states that the examination of three excised kidneys showed in one instance angioma of a papilla, in another merely congestion, and in the third the evidences of chronic infectious nephritis. Young observes that since bleeding re-

curred twice after operation in the third case, the condition was either bilateral or was not the original cause of the hæmaturia.

Kretschmer (20), in reviewing the microscopic findings in eighty-seven cases, noted the frequent occurrence of nephritic changes and stated that obscure hæmaturia may be due also to infections and to changes in the blood vessels of the pyramids, arteriosclerotic dilatation of small vessels, or angioma of the papillæ.

Although the microscopic findings in these obscure cases are varied and sometimes negative, Newman reminds us that we should hesitate to make a diagnosis of essential hæmaturia since careful search may reveal a few discrete lesions of a glomerulo-nephritis. And Schuller (21) states that there are practically always either gross or microscopic lesions in these bleeding kidneys.

Young and Walther (22) also believe that idiopathic hæmaturia is very rare. Morris (23), however, reported three instances in which, after nephrectomy, no lesion could be demonstrated. Kretschmer reported two negative microscopic findings in twenty-seven cases, and MacGowan, Levy (24), and Braasch each found no pathology in one instance. Ross (25) also observes that sometimes sections do not show the cause of the bleeding.

Rytina enumerates the causes to which obscure hæmaturia has been attributed as follows: (1) passive congestion, (2) patchy or diffuse fibrosis of the kidney, (3) chronic papillitis, (4) varicose papillæ, (5) nervous vasomotor reflexes without anatomical lesions, (6) glomerular nephritis, (7) bacillus coli communis infection, and (8) localized nephritis. Braasch concludes that the unexplained hæmaturias are due probably to chronic insidious infections confined around the papillæ.

The frequency of nephritic change has been noted by many observers. Kretschmer, for example, records the discovery of such changes in seventy-five of eighty-nine microscopic examinations. Bunts observes that operation revealed unsuspected nephritis in eleven cases, and Squier (26) states that the usual findings are those of a glomerulo-nephritis due probably to a chronic focal infection elsewhere in the body. Rytina believes that localized nephritis without the usual nephritis signs is probably the most frequent cause of obscure hæmaturia.

Ross observes that microscopic examination of kidneys removed for essential hæmaturia often reveals evidences of interstitial nephritis although the clinical signs and symptoms of nephritis are

lacking. Dowd reported a case of painless hæmaturia of five years' duration in which no abnormality was found when the pelvis of the kidney was opened. The bleeding stopped. Later albumin and hyaline casts appeared in the urine. Apparently the bleeding had been due to a chronic nephritis which had not been manifest before.

Walther (27) reported an instance in which, following nephrectomy to save life, microscopic examination revealed infectious nephritis. Young believes that obscure hæmaturia usually indicates a pre-nephritic renal disturbance. Most observers agree with Randall (28) and Spitzer (29) that chronic passive congestion is an important etiological factor in obscure renal hæmorrhage.

Renal calculi, tuberculosis, and tumors must be differentiated from the so-called essential hæmaturia because, according to Newman, they may be painless and, as Kretschmer states, they may often occasion profuse urinary hæmorrhage. Newman observes that these conditions and unilateral nephritis also are demonstrable by our usual diagnostic aids, the X-ray, bacteriologic and microscopic examinations of the urine, and cystoscopy.

On the other hand, Ross found evidences of interstitial nephritis on microscopic examination of excised bleeding kidneys although the clinical signs and symptoms of nephritis had been lacking. Rytina believes that localized nephritis without nephritic signs is the most frequent cause of obscure renal hæmorrhage, and Bunts observes that operation revealed nephritis in eleven cases undiagnosed before operation.

Regarding the differentiation from essential hæmorrhage Braasch states that in chronic nephritis the hæmaturia is scanty and other symptoms of nephritis are present. Infectious nephritis is indicated by the presence in the urine of pus and bacteria, by chills and fever, and frequently by a dull pain over one or both kidneys. Such infections are usually bilateral. Pyelitis is marked by dull persistent pain, whereas the pain of essential hæmaturia is caused only by a blood clot. The pus cells in pyelitis are few and pyelography shows irregularity of the renal pelvis. In renal tuberculosis hæmaturia is occasionally the only early symptom. Guinea-pig inoculation may clear up the difficult differentiation from essential hæmaturia. Braasch reminds us further that small stones may be negative to the X-ray and that the diagnosis of renal varix may depend upon the microscope.

The problem of differentiation between bleeding due to renal neoplasm and hæmorrhage of the

essential type demands thoughtful consideration. Essential hæmaturia is rare and Squier observes that renal tumors also are unusual. Both may be characterized merely by bleeding.

In this connection Ross states that hæmaturia is the primary symptom of malignant kidney neoplasms in 36 per cent of the cases and the only symptom in 12 per cent. Barney (30) observed bleeding as the first symptom in eighteen of seventy-four cases, and Willan (31) witnessed the same phenomenon in fourteen of fifty-two instances. Israel (32) noted hæmaturia as the initial symptom of hypernephroma in 70 per cent of sixty-six cases, and Denaclara (33) states that hæmaturia is very often an early, or the only, symptom of renal neoplasm. Hinman (34), in reviewing the statistics of eight surgeons, discovered that hæmaturia was the onset symptom in 301 of 709 cases.

The insidious onset of hypernephroma is illustrated by a case reported by Hinman in which death occurred seven months after the first and only attack of bleeding. In this instance a primary pyelogram was not made although the ureters were catheterized. After one experience of instrumentation the patient refused further examination. Hinman states that deformity of the renal pelvis is the most positive urological evidence of tumor although the diagnosis must rest, of course, upon a correlation of the clinical and the urological findings. Ross observes that as a rule renal tumor occurs in persons over 40 years of age; pain is slight, but hæmorrhage is frequent and severe. Ordinarily there is no frequency of urination or pyuria. There is absence of fever and sweat, and the loss of weight and of appetite progresses slowly. The tumor is marked and can be easily outlined by the X-ray. The finding of fragments of tumor and atypical cells in the urine makes the diagnosis of renal tumor comparatively positive.

Braasch (35) informs us that the hæmaturia of renal neoplasm usually lasts but a day or two and occurs at short and irregular intervals, whereas bleeding which is prolonged over several weeks or months with recurrences at long intervals suggests nephritic or essential hæmaturia. Differentiation is difficult if the tumor cannot be palpated. Pyelography reveals deformity in over two-thirds of the cases coming to operation, but early tumor may not show pelvic irregularity.

A tumor advanced enough to cause hæmaturia, however, would probably show deformity with pyelography but considerable variation in the pelvic outline is necessary to distinguish the normal from the abnormal. Of twenty-two cases

with operation in which pyelography was employed recognizable deformity was demonstrated in seventeen. Profuse hæmaturia is a grave symptom and should be considered a symptom of malignancy until it can be proved otherwise. "Even after all possible clinical evidence has been obtained, the question will often be raised whether or not operation is indicated. Tumor of the kidney was discovered at operation in two cases in which the clinical evidence rather suggested essential hæmaturia."

In this connection Braasch cites the case of a man aged 50 years who had had hæmaturia for three months with a weight loss of 15 lb. There was neither tumor nor pain. Cystoscopy disclosed the right kidney as the source of the bleeding but examination was otherwise negative. At operation the kidney appeared of normal size and form but after nephrectomy microscopic examination revealed hypernephroma. Rytina states that a beginning neoplasm may cause hæmaturia which would be diagnosed as of the essential type because all examinations are negative. Braasch makes the important observation that varicocele in a man 40 years of age or over which is of recent origin and associated with unexplained hæmaturia is very suggestive of hypernephroma.

The differentiation is further complicated by the fact that essential hæmaturia sometimes induces pain. Bunts, for example, observed this phenomenon in thirty-six of seventy cases. However, as it is due to the passage of blood clots through the ureter, it usually simulates renal colic rather than the pain due to a neoplasm.

The early diagnosis of renal tumor is exceptional since Hinman found that although hæmaturia was the onset symptom in 47 per cent of 709 cases, only 6.6 per cent showed hæmaturia without pain or tumor at the time of operation. Braasch, in reviewing eighty-three cases of hypernephroma, discovered that 77 per cent of these patients had observed hæmaturia for more than a year before other symptoms necessitated treatment. Of these eighty-three cases which came to operation the kidney was irremovable in twenty-two. Of sixty-one patients in this series who were subjected to nephrectomy seven died in the hospital and twenty-seven succumbed later. One case in five is clinically considered inoperable.

Young, on the other hand, stresses the fact that renal tumors can usually be diagnosed before operation and reminds us that malignant disease is rarely if ever discovered by exploration. Braasch warns us that operation is not warranted by only one or two attacks of hæmaturia.

Levy, in a recent paper, voices the prevailing opinion regarding hæmaturia in his statement that the term indicates merely renal bleeding of unknown etiology and that such a diagnosis is arrived at by exclusion after a most thorough investigation.

The report of a case in which such examination was made, although merely confirmatory, seems amply justified since the condition remains a diagnostic mystery:

The subject of this report was a man aged 46 years, who had always been well except that he had had pneumonia about one year ago. Two months ago he fell, striking his back on the edge of a box. The resultant pain was transient and, to his knowledge, he never passed blood. The present disturbance began early in the morning of May 24, 1921. The patient was awakened from a sound sleep by an agonizing pain in the right side of the back.

One of us (Fowler) saw him in consultation with his family physician, Dr. G. C. Whitney, the same morning. Examination revealed a large, robust man evidently suffering intensely. The paroxysmal pain radiated from the back to the groin. Morphia afforded only partial relief. He voided by request with great difficulty about 4 oz. of clear urine. The pain was so characteristic in spite of the apparent absence of hæmaturia that the diagnosis of renal colic was concurred in.

Subsequent examination at the Highland Hospital by one of us (Waterman) yielded the following data:

Bladder normal. Left ureteral orifice normal. Catheter easily passes 7 inches from meatus. Right ureteral orifice of true "golf-hole" type. Catheter enters for $\frac{1}{2}$ inch only. On withdrawal, ribbon-like clots were expressed and followed by a gush of urine. The catheter could not be passed more than $\frac{1}{2}$ inch beyond the meatus even after several attempts. Phenolsulphonaphthalein injected. Excretion time three minutes from the left catheter, four minutes (transvesical) from right. Six per cent from both sides in fifteen minutes.

The radiographs of both kidneys and ureters revealed that the right kidney was somewhat larger than the left. There were no suspicious shadows. A pyelogram showed

the sodium bromide solution filling the pelvis of the left kidney and the two lower calices.

The diagnoses suggested to one of us (Waterman) were: (1) hypernephroma, (2) tuberculosis, (3) hæmatoma following the injury of the previous month, and (4) stone. The latter was not shown by the X-ray. The absence of ulceration and other bladder disturbances was against tuberculosis. The diminished excretion of phthalein on both sides was due probably to the inhibitory influence of the renal colic of the previous day and the pain of examination, but the equality of excretion and excretion time on both sides was rather against tumor, although in hypernephroma the excretion may not be affected. Tumor and hæmatoma were therefore to be considered the most probable causes. An exploratory incision was recommended. The possibility of essential hæmaturia was also to be considered.

The blood count showed 12,400 leucocytes and 72 per cent polymorphonuclears. The blood Wassermann was negative.

The examination of a single specimen of clear urine upon admission to the hospital prior to the urological investigation revealed merely the presence of a few pus and blood cells. This urine represented the output from the left kidney only as the right ureter was still completely plugged with blood clots. A twenty-four-hour specimen, completed two days later, in amount 32 oz. and with a specific gravity of 1.019, showed blood ++, mucus ++, albumin ++, and a few pus cells. The patient complained of colic following the injection into the left kidney pelvis. It is doubtful if he would have consented at any time to further instrumentation.

Operation was done May 27, 1921. The kidney, when delivered into the incision, appeared larger than normal and was encircled at its midsection by an irregular purplish discoloration. After some hesitation nephrectomy was decided upon chiefly because of uncertainty regarding the cause of the hæmaturia. Removal was difficult because of inaccessibility of the pedicle. A silk ligature was therefore applied.

Convalescence was complicated by infection, and a sinus persisted for several weeks. Even after apparently complete healing, pain in the back radiating along the course of the ilio-hypogastric nerve occurred frequently without apparent cause.

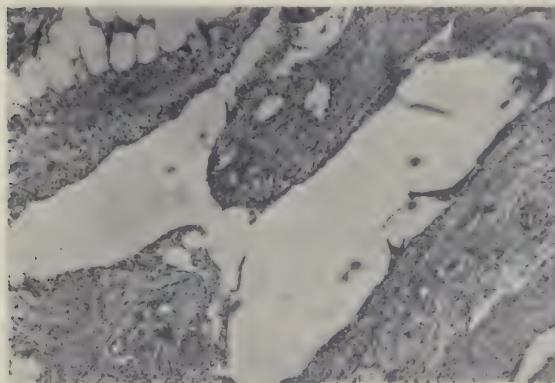


Fig. 1. Greatly dilated interlobar vein. In an adjoining field there is much blood beneath the pelvic mucosa. Cellular infiltration, which is marked in nearby fields, is only scattering here.

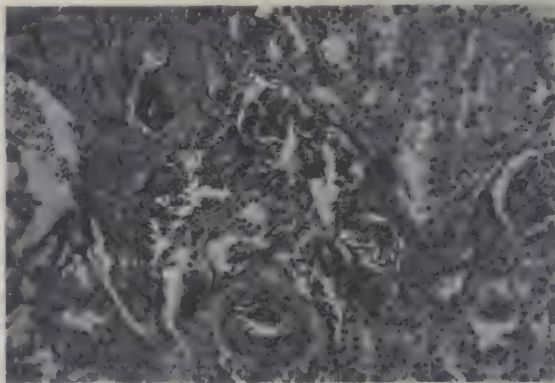


Fig. 2. Widely dilated venous channel at cortico-medullary junction.

Seven months after nephrectomy, intense pain, fever, and bulging about the incision developed simultaneously and a large abscess which contained the silk ligature in its depths was evacuated. As much of the latter was removed as practicable. Although the original cause of the post-operative infection is problematical, its perpetuation was due probably to the presence of the non-absorbable material.

The pathologic report was as follows:

"The kidney is about normal in size, weighing 150 gm. No abnormalities of form or color are noted. The capsule strips easily, leaving a smooth surface. The cortex and pyramids are negative on the cut surface. The mucosa of the pelvis is thickened and yellowish, and in places has attached to its surface thin layers of blood which cannot be wiped off easily.

Microscopic sections show extensive hæmorrhage beneath the pelvic mucosa and into the areolar tissue nearby. Many of the interlobar veins appear dilated. Much of the hæmorrhage lies near such dilated veins, though no actual venous rupture is found in the sections. At the level of the vascular arcade there are many widely dilated, thin-walled veins, amounting nearly to blood channels. These are not extensive, nor are all the veins involved in this way. At this level, a few arteries show a thickened intima, and some are completely obliterated. There is hæmorrhage into the tissues around some of these vessels. No abnormal fibrosis is observed. The capillaries of the cortex are in many cases widely dilated. Along the cortico-medullary junction near the vessels of the vascular arcade and beneath the pelvic mucosa near the tips of the papillæ there is a considerable cellular exudation consisting mainly of polymorphonuclear and endothelial cells. In the former location this is mostly in sharply circumscribed focal areas two or three times the diameter of a tubule. The tubules and glomeruli are negative throughout.

The pathological diagnosis was submucosal hæmorrhage in pelvis; varix of renal venules; focal infective nephritis; early arteriosclerosis.

Regarding treatment Levy states that nephrectomy is the only operation ever indicated, and then only as an emergency measure to save life; that non-operative measures such as the intrapelvic injection of silver nitrate and adrenalin, the passage of a ureteral catheter, the oral administration of calcium lactate, and the subcutaneous or intramuscular injection of horse serum have proved effectual, although it is unsafe to predict cures as recurrences are common, sometimes developing even after long intervals (eighteen recurrences in a series of thirty cases). Levy states further that the bleeding in essential hæmaturia often ceases spontaneously, that the general health is usually not affected by the loss of blood, that none of the carefully observed thirty cases developed subsequent serious kidney disease, and that the prognosis is favorable in spite of the recurrences and the loss of blood.

SUMMARY

1. Clinically, the so-called essential hæmaturia is rare and microscopically it is rarer still since

only occasionally does thorough examination of the excised kidney prove negative.

2. The apparent efficacy of various measures, both surgical and non-surgical, in the treatment of essential hæmaturia may be due to the fact that the bleeding often ceases spontaneously.

3. Between the cases considered idiopathic clinically and those proved idiopathic by the microscope lies a group including varicosities of the papillæ and early hypernephromata.

4. In view of the difficulties attendant upon the early diagnosis of renal malignancy, unilateral hæmaturia should be considered of malignant origin until proved otherwise.

5. The writers suggest the term "obscure hæmaturia" in preference to the term "essential hæmaturia."

The writers acknowledge their indebtedness to Dr. R. R. Mellon, Director of Laboratories, and Dr. W. S. Hastings, Tissue Pathologist, of the Highland Hospital, for their co-operation in the preparation of this paper.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Pickerill, H. P., and White, J. R.: The Tube Skin Flap in Plastic Surgery. *Brit. J. Surg.*, 1922, xi, 321.

The recent war led to many changes in the management of surgical lesions, especially in plastic surgery. The tube skin flap was first used extensively at Queen's Hospital, Sidcup. Pickerill, who was on the staff of Queen's Hospital, describes and discusses the methods employed. The purpose of the formation of a tube flap in plastic facial surgery is to convey tissue to the face from the chest, neck, scalp, or forehead in a viable state. The flap is almost sure to retain its vitality and its use reduces scarring of the face to the minimum. Such flaps lend themselves to what Pickerill terms "caterpillar grafting" which is of particular value when the tissue must be obtained from areas without large blood vessels.

The tube graft is an extension of the idea of the tube flap and is applicable especially to plastic work on the lips and palatal defects. The double tube flap lends itself to plastic reconstruction of the nose, chin, and cheek. White describes his methods of applying the principles learned of plastic surgery of the face to plastic work in general surgery. The failure of chronic ulcers to heal is due to fibrosis in the deeper layers. White describes a method of dealing with such cases which gives very satisfactory results.

M. R. FLYNN, M.D.

ANÆSTHESIA

Groenberg, J.: Studies of Blood Ferments in Men and Animals in Narcosis and Certain Poisonings (Studien ueber die Blutfermente bei Menschen und Tieren bei Narkosen und einigen Vergiftungen). *Finska laek.-saellsk. handl.*, 1921, lxiii, 429.

The author studied the effects of ether, chloroform, carbolic acid, lysol, veronal, morphine, and lead on the blood ferments by Abderhalden's dialysis. To determine the effects of ether and chloroform, the serum of young and healthy patients operated on for surgical lesions acquired in the war or for hernia, and the serum of rabbits and dogs was tested during and after the narcosis with substrata of various organs. In acute poisoning the test was made only once, but in chronic poisonings it was tested twice, at an interval of two to four weeks. At the same time, for purposes of control, parallel tests were made with the same substrata with sera from normal persons.

The tests showed that almost all sera of men and animals subjected to the effects of ether, chloroform, carbolic acid, lysol, veronal, morphine, or material containing lead contain Abderhalden's prophylactic ferments reacting to brain and nerve substance. When ether was used the reactions of serum and lung were more frequently positive than when chloroform was employed. In acute poisoning with carbolic acid or lysol, substrata of liver and kidney in particular were attacked, while the serum of patients poisoned with veronal reacted only to liver. In chronic morphinism and lead poisoning the result was the same, the sera almost constantly attacking the liver. The serum of morphine addicts appeared to be peculiar in that it had a positive reaction in respect to the thyroid.

Before the narcosis from ether or chloroform, the sera of all the individuals tested showed a negative reaction with respect to all the substrata tried out, but during the narcosis the reaction was positive with regard to certain substrata. Further, sera taken from cases of acute or chronic poisoning showed a positive Abderhalden reaction with regard to certain substrata, while the sera of normal individuals, tested at the same time, showed a negative reaction to the same substrata.

From this research the impression is gained that substances with pronounced toxic qualities, besides causing the clinical symptoms which can be demonstrated objectively in the usual examination of the patient, affect the blood in such a manner as to cause the formation of ferments which are not present in the blood of normal individuals. If all the precautions mentioned by Abderhalden are taken and the reactions are judged with great care, one comes to the conclusion that, in spite of its defects in the present stage of its development, dialysis gives typical results which speak in favor of the correctness of Abderhalden's ideas regarding prophylactic ferments.

Details of the tests and case histories are given in the article.

KORITZINSKY (Z).

Gwathmey, J. T., and Greenough, J.: Experiences with Synergistic Anæsthesia. *Am. J. Surg.*, 1922, xxxvi, Anæ. Supp., 22.

Gwathmey discusses the synergistic action of magnesium sulphate with other anæsthetics and describes in detail experiments on animals.

Clinically he has used magnesium sulphate with morphine and chloretone in thirty-nine cases; these drugs were employed with nitrous oxide-oxygen and novocaine in twenty-one cases, ether in one

case, nitrous oxide-oxygen and ether in eight cases, nitrous oxide-oxygen and novocaine in four cases, and novocaine alone in five cases. The technique employed is described. The authors' conclusions are as follows:

1. Magnesium sulphate may be combined with nitrous oxide or ether for anaesthesia to the advantage of both.

2. The synergistic action of the magnesium sulphate decreases by about one-half the amount of nitrous oxide or ether necessary for anaesthesia.

3. Morphine, magnesium sulphate, and nitrous oxide-oxygen give more relaxation than morphine and nitrous oxide-oxygen, and frequently as much as morphine, nitrous-oxide oxygen, and ether.

4. With the technique described a very satisfactory anaesthesia may be induced with reduction or elimination of postoperative nausea, vomiting, pain, distention, pneumonia, and shock.

ISABELLA C. HERB, M.D.

McCurdy, J. R.: Rebreathing and Etherization.
Am. J. Surg., 1922, xxxvi, Anæ. Supp., 2.

McCurdy discusses particularly the advantages of rebreathing during etherization. He is of the opinion that they depend upon the tension or relative volume of carbon dioxide in the blood and tissues during anaesthesia. Any amount of rebreathing, if maintained for more than a few breaths, causes a relative change in the carbon dioxide tension. The ratio of this change varies directly with the percentage of tidal air rebreathed. There occurs, therefore, a gradual and progressive accumulation of surplus or overload of carbon dioxide in the blood and tissues — an increased carbon dioxide tension — which hypothetically will go on to carbon dioxide poisoning or asphyxia. Practically, this is regulated and controlled by the amount of oxygen admitted, the amount of exhalation permitted to escape, and the amount of ether vapor added to the inspired air. Another very important element which enters into this control to a greater or lesser extent in every closed ether apparatus is intrapulmonic pressure in excess of the normal which is created either negatively by flexible resistance to exhalation or positively by mechanical force added to inhalation. With the increased carbon dioxide tension there is a relative diminution in the oxygen content of the blood. Other factors to be considered are the heat, moisture, and waste products of metabolism other than carbon dioxide in the expired air.

For the past seven years the author has been using a mixture of 10 per cent carbon dioxide and 90 per cent oxygen in all conditions of depressed respiration and circulation during ether anaesthesia. This causes an increased respiratory rate and volume, a stronger pulse, and an increase in the blood pressure. He states that if rebreathing of ether vapor is to be non-injurious, beneficial, and scientific it must be measurable and flexible and adjustable as to volume, the anaesthetist must be able to regulate the percentage of carbon dioxide and the oxygen

pressure at will, and the anaesthesia must be suited to the varying conditions of pathology, metabolism, and surgical shock.

ISABELLA C. HERB, M.D.

Webster, W.: A Consideration of Ethyl-Chloride Anaesthesia. *Am. J. Surg.*, 1922, xxxvi, Anæ. Supp., 10.

Webster discusses the chemistry of ethyl-chloride anaesthesia, its physiological effects, scope, and utility, the methods by which it is induced, its after-effects, and its mortality.

In regard to safety, which must always be the chief consideration in the use of any anaesthetic, he states that nitrous oxide is undoubtedly better than ethyl chloride. It lacks the portability of ethyl chloride, however, and unless it is administered with oxygen continuously, the duration of the anaesthesia is not so great as when ethyl chloride is used.

If necessary, the dose of ethyl chloride may be repeated several times. In certain dental cases requiring a large number of difficult extractions two and even three capsules may be used. In such cases the recovery period is somewhat more prolonged and the tendency to nausea is increased, but not nearly to the same extent as when chloroform or ether is used for the same length of time.

ISABELLA C. HERB, M.D.

Guedel, A. E.: Ethyl-Chloride General Anaesthesia: A Classification of Signs of Overdose and Its Action on the Cardiovascular System. *Am. J. Surg.*, 1922, xxxvi, Anæ. Supp., 14.

Guedel's report is based upon personal observations made during the past five years in the use of ethyl chloride for general anaesthesia in about 2,000 cases. Most of the operations consumed from one to five minutes, but about 200 required from fifteen minutes to one hour. In nineteen cases carefully studied the average time of operation was fifty-three minutes.

Most of the author's observations were made upon wounded soldiers in good physical condition.

Ethyl chloride in overdose produces one of two types of symptoms, the spasm type and the respiratory depression type.

Approximately nine out of ten patients overdosed with ethyl chloride manifest the spasm type of symptoms.

The first indication of approaching spasm is a sardonic grin due to contraction of the muscles about the mouth. About the same time there is beginning contraction of the masseter muscles and beginning crowing of inspiration. This crowing, which is due to partial obstruction of inspiration, is the chief warning that the dose must be reduced.

If the overdose of the drug is continued, the spasm progresses rapidly until, in about one or one and a half minutes, it completely obstructs respiration and causes peripheral asphyxia.

When the masseteric spasm is well developed, it is practically impossible to pry the jaws apart sufficiently to insert a mouth gag.

When the general spasm is well developed, all of the muscles of the body are somewhat rigid but chiefly the muscles of the face, mouth, pharynx, and larynx. The respiratory effort is violent.

Once inaugurated, the spasm develops so rapidly that cyanosis usually does not appear until the obstruction is almost total. It then develops very rapidly and in about half a minute the patient is black.

The rapidity of progress of the spasm is apparently in proportion to the vapor tension of the ethyl chloride.

In prolonged ethyl-chloride anaesthesia the spasm may re-appear as often as the patient is overdosed. In many cases the latitude between operative anaesthesia and consciousness is so narrow and the stage of overdose so close to the operative state that it is difficult to maintain anaesthesia without frequently causing the beginning of this spasm.

With knowledge of this action there is ample warning from the beginning spasm to avoid its more serious aspects by the immediate removal of the drug.

The beginner in the use of ethyl chloride should always insert a mouth gag before starting the anaesthesia.

The depression type of symptoms of overdosage of ethyl chloride is a progressive central respiratory depression and occurs in approximately one of ten cases in which an overdose is given. From the onset, the respiratory effort grows less, both in volume and in rate. The depression in volume is greater than that of the rate. With the continuance of the drug in overdose, this depression progresses to a complete respiratory paralysis in from one-half to two minutes, depending upon the patient's resistance and the vapor tension of the drug. The patient is entirely relaxed.

The picture during the deeper degrees of depression is one of collapse. The color is ashen, the pupils are widely dilated, and the respiratory effort, if there is any at all, is feeble. The picture resembles that of cardiac syncope, but the pulse, although slowed, is of good quality and regular. In fact, it seems to be affected in rate only, and in cases of light depression is not affected at all. Clinically, in many cases of this depression the author has not found any change in the pulse other than a moderate slowing. The greatest fall in pulse rate observed by him was from 100 to 50 in a period of five minutes, during one minute of which there was no respiratory effort whatever.

The slowing pulse rate begins with the slowing of the respiration and progresses with the respiratory depression.

Like the spasm, this respiratory depression may be repeated during the same anaesthesia as often as the patient is overdosed. Following recovery, the anaesthesia may be continued as usual.

During the depression there is a progressive secondary dilatation of the pupils. This does not occur in spasm.

To the observant anaesthetist there is ample warning of the approach of the depression. Therefore total paralysis of the center can be avoided. If it occurs, however, resuscitation is simple. As there is no respiratory obstruction, two or three forceful manual compressions of the thorax serve to eliminate the excess of the drug from the respiratory center and automatic respiration is re-established to carry itself to the anaesthetic normal in from one to four minutes.

The first stage of dilatation of the pupils is more marked than that caused by any other anaesthetic. Early dilatation is of no importance. Dilatation of the pupil after anaesthesia is well begun occurs only in cases of overdose causing respiratory depression.

It is impossible to pre-determine the type of symptoms that will be produced by overdosage in a given case, but when a type is once manifested, it remains constant throughout the anaesthesia. The author has seen only one case which manifested both the spasm and the depression types during the same anaesthesia, and in this instance neither of the syndromes was typical. ISABELLA C. HERB, M.D.

Boyle, H. E.: Gas-Oxygen-Ethanesal-Chloroform Combined Anaesthesia for Nose and Throat and Abdominal Surgery. *Am. J. Surg.*, 1922, xxxvi, Anæ. Supp., 17.

Boyle discusses ethanesal, a new anaesthetic agent which has been prepared recently by Wallis and Hewer. Wallis has found that an absolutely pure ether will not produce anaesthesia; that it is merely a vehicle to convey the true complex anaesthetic. Ethanesal is a compound of ketone in which carbon dioxide and other gases are united. This ketone complex is dissolved in pure ether to the extent of from 2 to 5 per cent.

The purification of the ether, a necessary preliminary, is carried out in two stages: (1) the oxidation of aldehydes and mercaptans by finely divided permanganate, and (2) the removal of acids, peroxides, and water by means of anhydrous copper sulphate. By distillation in a special condenser a pure ether with a constant boiling point and remarkable properties is obtained. The author summarizes its properties as follows:

1. It is anaesthetic only in very large quantities.
2. It is a cerebral excitant. When the ketone is added to this pure ether its properties change at once.
3. It is a safe and reliable anaesthetic.
4. Its action on the circulatory system lies between that of chloroform and that of ether.
5. It causes none of the irritating effects usually produced by ordinary anaesthetic ethers.
6. By means of it analgesia can be maintained for a prolonged period.
7. It is practically non-toxic. Large doses given to animals do not kill them.
8. It does not produce either glycosuria or ketosis and does not aggravate these conditions when they are present.

9. In animals it is without effect on the blood pressure or respiration.

The agent responsible for the anæsthetic action is the ketone complex. This is non-toxic in the amount given in the anæsthetic ethanesal.

Many hypnotics and analgesics owe their specific action to the ketones they contain.

As ketones are not easily oxidized, they are present even in the very poor samples of ordinary ether. On the other hand, some of the higher grades of anæsthetic ether have very little anæsthetic action because of a deficiency in their ketone complex.

ISABELLA C. HERB, M.D.

Farr, R. E.: Infiltration and Infiltration Block vs. Regional Anæsthesia in Abdominal Work. N. York State J. M., 1922, xxii, 49.

Simplicity, speed, accuracy, and minimal disturbance of the patient are the important elements in the induction of local anæsthesia in abdominal surgery. Direct infiltration and infiltration-block possess these attributes to a much higher degree than regional anæsthesia. The principal advantage of regional anæsthesia is that it requires the use of a smaller amount of the anæsthetic. That this is an advantage cannot be gainsaid but the simple infiltration of the abdominal wall for the induction of anæsthesia is without danger. So far as the author knows, there have been no accidents due to this procedure. Provided the usual infiltration or a circumferential block is used, the dose differs but slightly from that necessary for regional blocking.

As the result of increased experience operations which were formerly thought to be difficult or impossible are now performed routinely under local anæsthesia. In other words, we have learned that many of our failures were due to inability to use the method properly.

Direct infiltration with the pneumatic injector makes it possible to establish anæsthesia with the minimum of discomfort to the patient. By this method the solution may be disseminated throughout the area of the incision in less than three minutes in any case and immediate and complete anæsthesia obtained in nearly every instance.

In the pelvis the more simple work is preceded by a blocking of the round ligaments and ovarian pedicles. More extensive operations, such as uncomplicated hysterectomies, may be performed under an infiltration across the round ligament and about the uterine cervix. Complete pelvic anæsthesia may be obtained by blocking the sacral nerves from in front or by means of caudal anæsthesia. If there is to be operative traction on the mesentery, operation must be preceded by a mesenteric block. In the upper abdomen splanchnic anæsthesia is induced, the anæsthetic being injected by the anterior method, a modification of that proposed by Kappis. Cholecystectomies, choledochotomies, and the most extensive stomach resections may be done quite painlessly by this method.

ISABELLA C. HERB, M.D.

Bulson A. E., Jr.: Butyn, a New Synthetic Local Anæsthetic: Report Concerning Its Clinical Use—Special Report of the Committee on Local Anæsthesia of the Section on Ophthalmology of the American Medical Association. J. Am. M. Ass., 1922, lxxviii, 343.

Repeated trials with butyn as an anæsthetic indicate a striking rapidity of action as demonstrated by the fact that one minute after one instillation of a 2 per cent solution into the eye the surface anæsthesia is sufficient to permit touching of the cornea without discomfort. In the average case this surface anæsthesia lasts from fifteen to twenty minutes, but occasionally it has persisted for from twenty-five to thirty minutes. The depth of anæsthesia produced by one instillation is not sufficient for operations or the removal of deeply embedded foreign bodies in the cornea but allows the painless extraction of superficial foreign bodies, the application of irritating astringents, and the determination of intra-ocular pressure with the tonometer. When the number of instillations is increased, the depth, degree, and duration of the anæsthesia are decidedly increased.

For operative work the committee has followed the plan generally used when cocaine is the anæsthetic employed; four instillations are given three minutes apart and the operative work is begun from five to ten minutes after the last instillation. This method produces an anæsthesia deep and complete enough for all of the more common major operations on the eye, with the exception of enucleation which up to the present time has not been performed under butyn anæsthesia by any member of the committee. The anæsthesia appears to reach its maximum at about five to eight minutes after the fourth instillation of the anæsthetic. Its duration is from twenty to thirty minutes in the average case, although frequently it lasts much longer, in a few instances for nearly an hour.

One instillation of a 2 per cent solution of butyn almost invariably produces a mild hyperæmia of the conjunctiva. This is not noticeably increased by subsequent instillations of the anæsthetic. It is controlled readily by epinephrin solution or may be averted by combining epinephrin with the butyn. When epinephrin is not employed, the hyperæmia gradually disappears in from thirty to sixty minutes. It seems to be more marked and of longer duration in diseased eyes, even though the active stage of the disease has passed.

The committee is unanimous in the opinion that for purely surface anæsthesia for minor operations butyn is superior to cocaine as it acts more quickly, it gives the desired effect after fewer applications, it does not cause objectionable side actions, such as dilatation of the pupil and desiccation of the cornea, and it produces a more profound anæsthesia.

For major operations, particularly those requiring opening of the eyeball, such as iridectomy and cataract extraction, the technique employed to obtain butyn anæsthesia is the same as that

usually employed to induce cocaine anaesthesia. The use of a 2 per cent solution of butyn results in a more profound anaesthesia than that obtained with a 4 per cent solution of cocaine, and has no objectionable effects. For operations on the extrinsic muscles of the eyeball the results are equal to those obtained with cocaine, but the committee believes that a solution stronger than a 2 per cent solution may be preferable.

As butyn produces no ischaemic effects, there is no shrinking of tissues following its use; hence the condition of the intranasal tissues remains approximately unchanged. This is of importance when a portion or all of a turbinate is to be removed. When combined with epinephrin, butyn in 5 per cent solution produces an anaesthesia sufficient for all of the major intranasal operations, including submucous resection of the septum, turbinotomy, and intranasal operations on the accessory sinuses. Not only is the anaesthesia very satisfactory, but up to the present time not the slightest toxic effects have been noted in the hundreds of operative cases in which the anaesthetic has been used.

The committee now has a detailed record of clinical experiences with butyn in several hundred major operations on the eye, the nose, and the throat. These include cataract extraction, iridectomy (including that done for the relief of glaucoma), trephine operations, magnet extraction of foreign bodies, tenotomy and advancement of the ocular muscles, pterygium operations, the removal of cysts and other tumors from the eyeball or lids, grattage, and a few cases of plastic surgery of the

lids, including the correction of entropion and ectropion.

Local anaesthesia is tested best when used for operations which involve cutting of the iris or intrinsic muscles of the eyeball. December 1, the committee had a record of thirty-nine cataract extractions combined with iridectomy, twenty-three iridectomies performed for glaucoma or as operations preliminary to cataract extraction, twenty-one capsulotomies and iridectomies, and eight muscle advancements, all done satisfactorily under butyn anaesthesia.

Butyn anaesthesia has been used in practically all of the major intranasal operations, including submucous resection of the septum, turbinotomies, opening of the accessory sinuses (including exenteration of the ethmoid cells), tonsillectomy, and adenoidectomy, numbering in all nearly 200 cases.

The results of the clinical and experimental use of butyn seem to justify the following conclusions:

1. Butyn is more powerful than cocaine and therefore a smaller quantity is required.
2. It acts more rapidly than cocaine.
3. Its action is more prolonged than that of cocaine.
4. According to experience to date, butyn in the quantity required is less toxic than cocaine.
5. It produces no drying effect on the tissues.
6. It produces no change in the size of the pupil.
7. It has no ischaemic effect and therefore does not cause shrinking of the tissues.
8. It can be boiled without impairing its anaesthetic efficiency.

ISABELLA C. HERR, M.D.

SURGERY OF THE HEAD AND NECK

HEAD

Cutler, E. C.: *The Relation of the Hypophysis to Antibody Production*. *J. Exper. M.*, 1922, xxxv, 243.

The important part that many of the endocrine organs play in development and function suggests the possibility that they may enter also into the mechanism of resistance to infection. Up to the present time there is little positive evidence that such is the case. It was felt, however, that a study of the more inaccessible glands of internal secretion whose function in relation to immunity had not been investigated might yield valuable information. Hence a study of the pituitary gland was made as part of a general investigation into this field.

The guinea pig was selected as the experimental animal because its reactions had already been standardized in immunological studies. An operative technique was elaborated for partial hypophysectomy. The serum reactions of typhoid agglutination, hæmagglutination, and hæmolysis were studied. These studies were run in the following series: Series 1, the production of antibodies after hypophysectomy; Series 2, the effect of hypophysectomy

on antibody production; and Series 3, the effect of feeding and injecting pituitary extract on the production of antibodies. A detailed description of the operative technique and the serum reactions is given, and the experimental findings are recorded. The results of the study are summarized as follows:

Guinea pigs immunized to bacillus typhosus produced specific agglutinins in the same quantity and at the same rate as guinea pigs not operated upon and as operative controls immunized at the same time and by the same method.

In guinea pigs previously immunized to bacillus typhosus and red blood corpuscles of the hen, partial hypophysectomy had no effect on the continued production and persistence of typhoid agglutinins, hæmagglutinins, and hæmolysins.

In guinea pigs immunized to bacillus typhosus, both the continued ingestion and the intraperitoneal injection of the whole pituitary gland extract had no effect on the subsequent agglutinin titers as compared with those of normal animals.

The experiments appear to show either that the hypophysis does not play an important direct or indirect part in the production of and persistence in the blood of typhoid agglutinins, hæmagglutinins,

and hæmolyins, or that the amount of hypophysis left behind in the operation to maintain life is adequate also to exercise the degree of functional influence on these processes which the entire hypophysis conceivably exercises.

ADOLPH HARTUNG, M.D.

Prečechtěl, A.: Subcranial and Cervical Abscesses Following Suppurative Processes of the Middle Ear (Subkranielle und Halsabscesse nach eitrigen Mittelohrprozessen). *Sborn. lek.*, 1921, xxii, 119.

This is a comprehensive work in the form of a monograph. The mode of infection, general diseases (tuberculosis, diabetes, etc.), fractures of the base of the skull associated with otitis media, and traumatic hæmatomata of the base of the skull play an important role in the extension of otogenous abscesses toward the base of the skull and the neck as far as the mediastinum.

The inflammation may penetrate the bone by the lymph passages, along the blood vessels (the jugular vein, the mastoid and condyloid emissary veins) or directly by destruction of the bone and the formation of fistula. Further progress into the soft parts at the base of the skull and the neck usually occurs—except in very severe infections—along definite anatomical routes, the spaces formed by muscles and aponeuroses. These are: (1) the suboccipital space, between the four layers of muscles of the nape of the neck; (2) the retrostyloid space below the prevertebral fascia or its lateral process, between the sternocleidomastoid muscle and the bundle of large vessels and nerves; (3) the retropharyngeal space at the anterior wall of the vertebral column, which continues into the posterior mediastinum; (4) the prestyloid space, between the wall of the pharynx, the descending ramus of the lower jaw, and the pterygoid muscles; and (5) the prevascular space, between the trachea and the muscles of the hyoid bone, which is continuous below with the anterior mediastinum.

The subcranial abscesses originating in the ear are of the following topographical and anatomical types:

1. Subcutaneous abscesses.
2. Abscesses of the sternocleidomastoid muscle and its sheath following perforation of the tip of the mastoid process.
3. Bezold's abscesses, deep abscesses of the sternocleidomastoid region which not infrequently are associated with other abscesses or involve other spaces. They advance toward the trapezius or the deep musculature of the nape of the neck, along the occipital artery or medially along the digastric muscle to the large vessels. In rare instances they enter the retropharyngeal or retrovisceral spaces.
4. Abscesses between the posterior belly of the digastric muscle and the large vessels (Mouret's type), medial to Bezold's abscesses. These arise principally from an inferior or posterior mastoiditis.
5. Abscesses in the tissue clefts of the large vessels, which descend along the jugular vein or through the jugular foramen or the occipitomastoid suture. They

may arise also indirectly from thrombosis of the lateral sinus.

6. Suboccipital abscesses or abscesses of the musculature of the nape of the neck, which may form in various ways, but develop usually following a phlebitis or periphlebitis along the condyloid or mastoid emissaries. In rare cases these abscesses may perforate through the occipital bone into the cranial cavity.

7. Retropharyngeal and parapharyngeal abscesses, the former in the retropharyngeal space, the latter in the prestyloid space in front of the cervicofacial diaphragm.

8. Anterior and posterior mediastinitis, which arises by continuity from the abscesses already mentioned.

The prognosis depends on the type of infection. In the author's cases the mortality was 6.2 per cent. Treatment aims especially at preventing the complications so far as possible by rational treatment of the otitis media. The abscesses should be opened early, each according to its situation. In mediastinitis an anterior or posterior mediastinotomy is indicated.

KINDL (Z).

Eagleton, W. P.: The Operative Treatment of Suppurative Meningitis with Especial Reference to Irrigation of the Cranial and Spinal Subarachnoid Spaces; and the Importance of Protective Meningitis from a Prognostic and Therapeutic Standpoint, with an Analysis of the Cases of Recovery—Exclusive of Meningococcic—Reported in the Literature. *Laryngoscope*, 1922, xxxii, 1.

The number of cures of general suppurative meningitis, either of local or blood-stream origin, is even smaller than generally is supposed. General suppurative meningitis with micro-organisms free in the cerebrospinal fluid system is almost always fatal.

The fundamental facts that suppurative meningitis is primarily a disease of the cerebrospinal fluid system—a circulatory system which, while intimately associated with the cerebral tissue and the blood circulatory system, is distinct from them—and that the cerebral tissue is involved only secondarily, are of prime importance in approaching the subject from the surgical standpoint.

The misconception that a fair proportion of recoveries from general suppurative meningitis of local origin have followed operation had its origin in the failure to appreciate the diagnostic and pathologic distinction between a lumbar puncture which reveals a cloudy fluid filled with leucocytes but without bacteria, indicating a protective and reparative process, and the puncture which yields a turbid or a clear fluid containing micro-organisms and indicating a general suppurative meningitis.

Consequently a considerable number of the cases of suppurative meningitis reported cured were in reality cases of protective meningitis, and while clinically they presented severe meningeal symp-

toms, the general cerebrospinal fluid system was not invaded by bacteria.

In a review of the literature the author collected thirty-one reports of cured cases. In the reported cases of cure from meningitis of blood-stream origin—five cases of pneumococcus meningitis—the successful treatment undoubtedly was the intraspinal injection of a serum which controlled the bacterial invasion of the meninges and probably stimulated the protective meningeal mechanism. The elimination of the blood-stream infection by the action of the blood alone or with the assistance of a serum or vaccine acting upon the circulating blood plays but a secondary part. Proving this is the immense number of spontaneous cures of pneumococcus blood-stream infection as compared with the almost constantly fatal result when the meninges become involved by the bacteria. Microscopic evidence warrants the belief that 25 per cent of all general pneumococcic invasions are associated with a protective meningeal reaction.

Of the twenty-one cases of general suppurative meningitis of local origin which were reported cured, over two-thirds, or from fifteen to seventeen cases, had had, prior to the general meningeal infection, a meningeal protective reaction which was in effect at the time of the general meningeal invasion. The invasion of the cerebrospinal circulatory system was possibly a temporary breaking loose of microorganisms through the limiting process.

On account of the relatively large proportion of cures in all the cases of local origin it is reasonable to assume that recovery was due largely to the presence and immediate action of this protective process assisted by the evacuation of the causative localized intra-dural suppuration (i.e., brain abscess, intra-piarchnoid abscess, or suppurative labyrinthitis), and in rare cases possibly by the elimination of a causative extra-dural suppurative focus which might have been associated with a pachymeningitis interna such as extra-dural abscess, sinus thrombosis, or adjacent caries of the bone.

If this deduction is correct, it is of prime importance in the treatment of general suppurative meningitis for the surgeon to direct his efforts to stimulating and assisting the protective meningeal mechanism. In the absence of a specific serum such as is now available for meningococcus meningitis this can be accomplished best by keeping the cerebrospinal pathways open by subarachnoid irrigations. The technique is described in detail.

In the small number of recovered cases of local origin in which apparently there was no protective process in operation—five in all—the curative agents were so diversified that they may be regarded as more or less accidental.

Lumbar puncture alone is undoubtedly of therapeutic value. Probably because it is the means of removing some of the infected fluid, and possibly by keeping open the cerebrospinal pathways it temporarily relieves the cerebral compression which favors intra-cerebral and meningeal suppuration.

The number of cases in which a cure has been effected by the intrathecal injection of serum either alone or in conjunction with other measures is too large to be ignored. It suggests that the intraspinal, intra-ventricular, or cerebro-subarachnoid injection of a serum, even if it possesses no specific action on the particular type of infecting organism, undoubtedly has a therapeutic value, probably because it stimulates a protective meningeal reaction to the foreign protein.

As a result of his analysis the author concludes that, if bacteria are free in the cerebrospinal fluid circulatory system in the presence of a localized focus of suppuration within or involving the dura, drainage of the intra-dural focus of infection with lumbar puncture offers a slight chance of recovery. In the absence of such an intra-dural suppuration, stimulation by a serum injected into the spinal or cerebral spaces of the cerebrospinal system offers a slight prospect of recovery. Logically, however, subarachnoid lavage holds out in all cases a prospect not offered by any other therapeutic measure as it alone keeps the cerebrospinal system of pathways open.

C. CORBIN YANCEY, M.D.

Meyer, A. W.: A Method to Discover Brain Tumors at Trephination by Measuring the Electrical Resistance (Methode zum Auffinden von Hirntumoren bei der Trepanation durch elektrische Widerstandsmessung). *Zentralbl. f. Chir.*, 1921, xlviii, 1824.

The localization of tumors of the brain has heretofore presented considerable difficulty. Puncture, palpation, percussion of the skull, etc., the means used up to the present time, have often given unsatisfactory results. On the assumption that the brain mass, because it is more fatty, would have a greater electrical resistance than a brain tumor, blood, or fluid, Meyer examined its electrical conductivity in cadavers and animals. The expected differences were found and were in fact so great that tumor resistance could be confused at most only with blood resistance. Since this is of no practical importance—one would not be apt to make the mistake of inserting both electrodes into one brain sinus—the measurement of the electrical conductivity will give valuable aid in the localization of brain tumors.

A fine, aseptic bipolar electrode is inserted into the brain in various directions. The method was found to be of practical value in the first case in which it was used.

WREDE (Z).

Hultén, O.: The Development of the Falx Cerebri and the Tentorium Cerebelli, Considered in Consequence of a Case of Malformation (Ueber die Entwicklung der Falx cerebri und des Tentorium cerebelli im Anschluss an einen Fall von Missbildung derselben). *Upsala Lækarref. Förelh.*, 1921, xxvi, 18.

The falx and tentorium are developed by plastic modeling of the connective tissue during the growth

of the brain. Because of the arrangement and branching of the vessels (the two anterior cerebral arteries between the cerebral vesicles and the posterior cerebral and superior cerebellar arteries between the cerebrum and cerebellum), this connective tissue is divided into a non-vascular middle zone and two vascular lateral zones. The middle layer attains in its further course a functional connection with the skull, while the vascular lateral layers attain, by the ramifications of their vessels into the brain mass, an intimate correlation with the brain. The pulsations of the brain finally cause a splitting of the three layers. The cleft then becomes the subdural space, the non-vascular middle layer becomes the falx or tentorium, and the vascular lateral layers become the soft cerebral membranes.

The structures of falx and tentorium are distinctly suited to their function of reinforcing the skull; the tentorium has an upper fibrous layer with a frontal direction which opposes forces tending to enlarge the frontal diameter of the skull, while below are strong bundles of fibers extending from the posterior clinoid process to the internal occipital protuberance which oppose widening of the skull in its sagittal diameter.

Following this account of the development of the falx and tentorium, Hultén describes a case of defect of the falx and malformation of the tentorium in a 70-year-old woman. This condition he attributes to a primary vascular anomaly in the region of the anterior cerebral artery. WREDE (Z).

Hesser, C., and Troell, A.: The Problem of Cerebellar Localization (Zur Diskussion ueber das cerebellare Lokalisationsproblem). *Uppsala Laetaref. Forh.*, 1921, xxvi, 20.

Chiefly through the work of Bolk, the Luciani doctrine of the functional homogeneity of the cerebellum has been replaced by the view that the cortex of the cerebellum shows a functional localization. It is believed by many that the cortex contains a large number of well-demarcated interdependent centers. The view is held also that each set of muscles working together and grouped according to direction of movement has its limited and separate area of projection on the cortical surface.

On the basis of their own animal experiments, the authors have come to the conclusion that muscle groups which carry out a definite movement together are represented by an interaction of cells or cell groups distributed over regions of the cerebellar cortex of greater or less size, but are not confined to these alone, being mingled with the cell groups of other synergistic muscles. Each cell unit is to be regarded as a functional unit or center. These cell unions are not ranged side by side in the cerebellar cortex like the squares of a chess board, but are between and above one another. Thus the centers do not have a gross topography such as is generally understood by the term "localization."

In discussing the problems of localization in the cerebellum one must not forget that it is by no means certain that the cerebellar cortical substance is a motor sphere, such, for instance, as the central region of the cerebrum. The cerebellum is an organ that works by reflexes, the motor impulses of which are called forth by perceptions from without carried directly to the cortex along the afferent paths of conduction. Theoretically, therefore, the cerebellar cortex may be considered a sensory (receptive) nerve substance. The findings of research on the anatomy of the fibers of the cerebellum agree very well with this theory.

Regarding the general function of the cerebellar cortex the authors point out that, in their animal experiments, severe, complicated cerebellar disturbances were to be ascribed less to an injury of the gray cortical substance alone than to a simultaneous injury of the paths of association below the cortex. WREDE (Z).

Horsley, J. S.: The Surgical Treatment of Extensive Basal-Cell Carcinoma. *J. Am. M. Ass.*, 1922 lxxviii, 412.

Cancers of the skin are of the basal-cell and the spinous-cell types. The basal-cell cancer is usually less malignant than the spinous-cell cancer. It does not metastasize, but extends by the continuity or contiguity of tissue. Even though it may occupy the same region on the face as the spinous-cell cancer and has access to the same lymphatics, its cells do not find favorable soil, and perish. On the basis of malignancy the spinous-cell cancer has several subtypes. The type in which the "pearls" predominate is the least malignant, while the types containing no "pearls" are rarely cured, even by the most thorough resection.

It is apparently useless to treat basal-cell cancer with the knife as the resistance of the neighboring tissue is lowered and the cancer cells are transplanted into the new raw surface. To prevent transplantation the surface of the cancer must be destroyed and sealed by cauterization. The excision must be done as far as possible by means of the actual cautery and the raw surface covered with tissue from a distance which still retains its normal resistance to the cancer cells.

The following cases are reported:

CASE 1. The patient was a man 49 years of age who had had a small ulcer on the left side of the upper lip for two years. At operation under ether the pharynx was packed with gauze and the anesthesia continued by means of a tube introduced into the upper part of the trachea. The cancer, which extended over most of the nose and the upper alveolar process, was cauterized with the Percy cautery, the mass of tissue was excised down to the bone by means of a sharp electric cautery, and the bone was removed. A skin flap was then outlined on the left side of the face with its base near the lower jaw and its body over the left pectoral region. The pedicle of the flap was dissected up and its

edges were brought together with a continuous suture of catgut according to the method of Gillies. After some minor plastic work complete healing occurred and there has been no recurrence after a period of eighteen months.

CASE 2. The patient was a woman 55 years old who for many years had had a lesion involving the right cheek, the right upper lip, and the nose. At operation the trachea was opened and the anaesthesia continued through a tracheal tube. The cancerous area was thoroughly cooked with the Percy cautery and removed with a sharp electric cautery. One skin flap was outlined on the forehead and another from below and then sutured in place, as in Case 1. A minor recurrence beneath the right eyelid and another at the stump of the alveolar process have been cauterized. The patient is still under observation. Both recurrences developed where the transplanted flap had not grown.

The author draws the conclusion that it is important to apply the raw surface of a pedunculated flap from a distance as soon as possible to the raw surface from which the cancer has been excised.

WILLIAM J. PICKETT, M.D.

NECK

Pemberton, J. deJ.: The Surgical Treatment of Toxic Goiters. *Boston M. & S. J.*, 1922, clxxxvi, 244.

The term "toxic goiter" includes exophthalmic goiter and hyperfunctioning adenomatous goiter. The statistics on exophthalmic goiter quoted in this article are based on 1,224 operations performed on 677 patients. The statistics on hyperfunctioning adenomatous goiter are based on 281 operations on 281 patients.

Exophthalmic goiter occurs in two forms, the remittent and the chronic. In the greater number of cases surgery is now the treatment of choice. The high operative risk, however, clearly contra-indicates operation in three phases of the disease: during an impending crisis (evidenced by a steady rise in the basal metabolic rate and loss of weight), during a crisis, and immediately after a crisis.

Surgically, cases of exophthalmic goiter are of three types: (1) those in which a primary thyroidectomy can be performed with reasonable safety, (2) those in which the advisability of thyroidectomy is doubtful, and (3) those in which indications for extended observation or preliminary measures are clearly defined.

It is important to increase the fluid intake to aid elimination and supply the higher calorie requirements. In cases of exophthalmic goiter local anaesthesia alone or combined with the minimum general anaesthesia that will satisfy the patient (gas oxygen or ether) is safest. After the ligation of both superior thyroid vessels and a period of rest (three months), remarkable improvement is usually noted.

With regard to thyroidectomy, the patient's age is the most important factor determining the amount

of gland to be saved; the largest amount is preserved in young persons.

Recurrences and a lack of the improvement normal to the majority of patients are due to one of four factors: (1) too early resumption of muscular exertion (overwork) and mental stress, (2) infection (recurrent), (3) failure to remove a sufficient amount of thyroid gland, or (4) irreparable visceral changes.

The syndrome due to an adenomatous goiter causing hyperfunction may resemble that of cardiovascular disease or that of true exophthalmic goiter. In all of these cases, however, the pre-operative medical measures and the strict operative procedures outlined for patients with exophthalmic goiter are of equal importance.

The thirty-five deaths (1.78 per cent) were due to: (1) accidental causes, (2) intense hyperthyroidism, or (3) moderate hyperthyroidism plus pulmonary complications due to the patient's lowered resistance incident to the long-continued progress of the disease or some intercurrent cause such as hæmorrhage or infection. MORRIS H. KAHN, M.D.

Crile, G. W., and Lower, W. E.: The Technique of Operations on the Thyroid Gland. *Surg., Gynec. & Obst.*, 1922, xxxiv, 258.

The authors describe the surgical technique evolved by them as the result of their experience in 3,512 operations on the thyroid gland.

LIGATIONS

Ligations are done under local anaesthesia and analgesia without moving the patient from bed. The superior thyroid artery is the artery of choice. The skin, subcutaneous tissues, muscles, etc. are flooded with 1:200 novocaine solution. The skin is divided parallel to the folds of the neck, the muscle fibers are separated with a narrow-blade hæmostatic forceps, and the upper pole of the gland is exposed. The artery is then picked up and ligated with silk. A second silk ligature is passed around most of the superior pole of the gland. This tissue and the subcutaneous margins are flooded with a 1:600 quinine-urea hydrochloride solution. The skin is closed with skin clips which are removed on the third day.

TYPICAL RESECTION OF THE THYROID GLAND

The patient is placed in an inclined position, feet downward, with the base of the neck elevated by a small pillow so as to elevate the chin. After infiltration of the skin and subcutaneous tissues with 1:200 novocaine solution the incision is made parallel to the natural folds at the juncture of the middle and lower thirds of the neck. In cases of small goiters, the pregladular muscles are divided vertically and held apart by retractors, but in cases of medium-sized or large goiters they are divided transversely between special muscle clamps after the areas to be grasped and divided have been infiltrated with novocaine.

The capsule and the entire portion of gland to be removed are then infiltrated with 1:200 novocaine

solution, care being taken not to infiltrate the recurrent nerves. The superior thyroid arteries are ligated with silk and the gland is resected, a margin of thyroid tissue being left along each lateral border from the upper to the lower margin. Before division, the tissue is grasped with Halsted forceps. Afterward the forceps are tied off with catgut on a needle. The division of tissue is done with a sharp knife on a clean field, and contact with the trachea or larynx is avoided. All vessels held by forceps are tied and a warm, moist gauze sponge is laid on the field.

After a thorough inspection of the field for bleeding, the head is raised and the preglandular muscles

are united with a buttonhole stitch of catgut. The vertical incision in the muscles is closed by suture, a small drain is inserted, and the skin is closed with clips. The drain is removed in twenty-four hours.

The procedure may be stopped at any point if the patient's condition indicates such interruption, in which case the wound is dressed with flavine or sterile gauze and the completion of the operation is delayed until a more opportune time.

In the authors' last 1,783 thyroidectomies, including 1,022 for exophthalmic goiter, the mortality was 1.4 per cent, and in their last 783 ligations, it was 0.16 per cent.

ALBERT W. HOLMAN, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Lukowsky, A.: Diffuse Fibromatosis of the Mammary Gland and Its Transition to Carcinoma (Ueber die diffuse Fibromatose der Mamma und ihren Uebergang in Carcinom). *Deutsche Ztschr. f. Chir.*, 1921, clxvii, 81.

There is as yet no unanimity of opinion regarding the nature of diffuse fibromatosis. Some authors consider it a tumor, others regard it as the product of chronic inflammation, while still others take a middle ground.

Lukowsky first reviews the literature and then describes the structure of the tissue in twelve cases he examined. He gives the most important clinical data in the majority of these cases and then discusses the differential diagnosis between cancer and atypical epithelial growths. He states that as long as the cells lie in normal organic association it cannot be told with certainty whether they are malignant or not. Glandular proliferation of unusual activity and an irregular arrangement of the gland ducts may strengthen the suspicion of carcinoma, but do not indicate it definitely. The only certain criterion of cancer is a destructive growth, and as long as this cannot be demonstrated a decision as to whether carcinoma is present or not is impossible.

Diffuse fibromatosis is neither a true tumor nor an inflammation; it is to be regarded as a chronic condition of irritation associated with active growth of connective tissue, retrogressive processes, and epithelial proliferation. The terms "cystadenoma mammae" and "chronic cystic mastitis" are unsatisfactory; "diffuse fibromatosis of the mammary gland" is histologically correct. The particular characteristics of the case can be brought out by the addition of such a phrase as "with cyst formation," "with fibro-adenoma formation," "with atypical epithelial proliferation," etc.

Every breast with diffuse fibromatosis should awaken the suspicion of cancer. Small foci of beginning carcinoma may be overlooked at the histologic examination. The fact that tissue excised for examination shows no signs of malignant epithelial growth is no security against the possibility that a cancer nodule may be found after the lapse of time,

because at the time of the excision for examination a small focus of carcinoma may have remained in the parts left behind. The specter of approaching carcinoma always threatens. Hence it is important for the surgeon to amputate the breast when a diagnosis of chronic cystic mastitis has been made.

COLLEY (Z).

TRACHEA AND LUNGS

Weiss, E., and Krusen, F. H.: A Foreign Body in the Lung for Thirty-five Years Complicated by Abscess and Tumor Formation. *J. Am. M. Ass.*, 1922, lxxviii, 506.

This very interesting case was that of a woman 37 years old who, when 13 months of age, had a violent attack of choking and coughing due apparently to the inhalation of a foreign body. Subsequently she was troubled continuously with cough and expectoration. At the age of 7 years a thoracotomy was performed but was unsuccessful. Except for the chest condition she was healthy. She had had six children. Four months before her death she was operated upon for some abdominal condition. After the operation the cough became more severe and she began to expectorate bloody sputum. She then was confined to her bed and suffered with severe pain in the right lower chest.

At the time she was seen by the authors she was emaciated, sallow, and slightly dyspnoic. Flatness at the right base and extreme tenderness of the skin were present.

Roentgen-ray examination revealed a round mass in the lower right chest and the presence of a foreign body resembling a scarf pin. The hæmoglobin was slightly diminished and there was a moderate leucocytosis.

Bronchoscopy evacuated foul pus but the foreign body was not found. Four days later death occurred from pulmonary hæmorrhage.

At autopsy, the right lung was found densely adherent at the base, and when it was separated dense masses of yellowish-white tissue resembling new-growth were found. The lower lobe was involved by a large multilocular abscess. In the center of the abscess the head of a scarf pin was found.

Sections showed chronic inflammatory tissue and a tumor process. The tumor had the appearance of squamous-cell carcinoma which probably arose from bronchial mucosa or alveolar epithelium.

ROSCOE C. WEBB, M.D.

Kernan, J. D., Jr.: Report of an Upholsterer's Tack in the Right Main Bronchus for Seven Years: Removal by Peroral Bronchoscopy: Drainage of Lung Abscess: Recovery. *Laryngoscope*, 1922, xxxii, 102.

Kernan reports the case of a girl, aged 21 years, who had suffered from an obscure pulmonary condition for seven years.

When first seen by the author she complained of hæmoptysis which had begun eighteen months previously. For seven years previously she had had frequent attacks of fever, night sweats, sharp pain in the right axilla, and a hacking cough.

On physical examination the right lung showed slightly diminished expansion and a triangular area at the right base behind, where diminished voice and breath sounds and fremitus were noted. Râles were present over the right lung and there was a slight leucocytosis. Careful study of the X-ray revealed a shadow suggesting a tack at the base of the right lung.

Under morphine and cocaine anæsthesia a bronchoscope was passed. The right bronchus was found to be closed by granulation tissue at about the origin of the first dorsal branch. This was pushed aside with forceps and a small bronchoscope passed into an abscess cavity. The tack was found and removed and the cavity cleaned. The symptoms cleared up rapidly.

The author calls attention to the importance of directly questioning all patients with obscure pulmonary conditions regarding the aspiration of a foreign body.

ROSCOE C. WEBB, M.D.

Haynes, G. S., and Gaskell, J. F.: A Case of Primary Carcinoma of the Lung. *Brit. M. J.*, 1922, i, 222.

Primary carcinoma of the lung is rare. Hamman states that this condition was found in only 2 per cent of 46,169 autopsies, and according to Ewing only 1 per cent of primary cancers occur in the lung.

Primary growths may be classified in three groups according to their origin: (1) those arising from the bronchial epithelium; (2) those arising from the bronchial mucous glands; and (3) those arising from the lung substance. Clinically, carcinoma of the lung presents itself as a chronic inflammatory disease of the lungs, a chronic pleurisy with effusion, or a local patch of permanent consolidation. The usual diagnosis is pulmonary tuberculosis, fibroid phthisis, or unresolved pneumonia.

The following case is reported:

A polisher, 27 years of age, was admitted to the hospital in December, complaining that for the last three weeks he had been troubled with dyspnoea, cough, and hæmoptysis. When examined he was

found to be poorly nourished and slightly dyspnoeic but not cyanosed. The physical signs were those of pleurisy with slight effusion and patchy consolidation of the lower lobe of the right lung. The condition was thought to be tuberculosis. During the first fortnight in the hospital there was some loss of weight, a daily evening rise of temperature to just under 100 degrees F., and an increasing pulse rate. The patient was kept in the open air and at the end of three weeks had slightly improved.

Toward the end of January well-marked signs of pneumothorax appeared. There was no pain or distress and the onset was very insidious. X-ray examination showed hydropneumothorax on the right side. A few days later a sterile blood-stained fluid containing polymorphonuclear and mononuclear leucocytes in about equal numbers was aspirated from the right chest. The pneumothorax slowly disappeared, leaving the right chest flat and immobile, dull to percussion, and with very feeble breath sounds. The heart was displaced to the right. Early in March enlargement of the left cervical glands was noted. Toward the end of the month hoarseness, stridor, and œdema of the face began and the superficial veins of the upper thorax became engorged. The obstruction increased and the patient died in April. During the last eight weeks his temperature was normal or subnormal.

At autopsy almost the whole right lung was found to be involved by a hard, white fibrous growth. This was most dense at the hilum and involved the walls of the bronchus almost to the bifurcation. The left lung was entirely free from the growth and was emphysematous and congested. The left chest cavity contained about a pint of milky fluid which was chylous in nature and due probably to involvement of the thoracic duct. The bronchial and tracheal glands were involved and formed a continuous chain with those in the neck. On the upper surface of the liver were four small nodules. Microscopic examination showed the lung substance to be replaced by a mass of cubical cells which were arranged irregularly in most areas but here and there showed palisade-like arrangement. The original structure of the lung was indicated only by bronchial cartilage belonging to the larger bronchi. The condition was diagnosed as carcinoma of the cuboidal-cell type which probably had grown from the termination of the bronchioles. The secondary nodules on the liver resembled those in the lung.

Points emphasized by the authors are the age of the patient (27 years), the duration of the symptoms (five months), the similarity of the symptoms to those of tuberculosis of the lungs, the temporary improvement under open air treatment, the total absence of pain, the involvement of one lung only, and the rapid enlargement of the mediastinal and cervical glands. Although it was the right lung which was involved, the left lymph glands were considerably more affected than the right lymph glands. The path of spread was probably along the thoracic duct.

RALPH B. BETTMAN, M.D.

Imperator, C. J.: Primary Adenocarcinoma of the Bronchus. *Laryngoscope*, 1922, xxii, 123.

For the past ten years the patient had felt weak and usually tired. Ten weeks before his admission to the hospital he became weaker and developed a cough with expectoration, fever, and night sweats. There was no hæmoptysis or pain in the chest.

Physical examination revealed a poorly nourished anæmic male with a long chest of the phthisical type with signs of fluid at the base. Compensated endocarditis was found. There was no clubbing of the fingers. The sputum examination for tubercle bacilli was negative.

Roentgenograms made at intervals over a period of five weeks showed congestion of the upper lobes of the lungs, interlobar plastic pleurisy, and marked thickening of the pleura at the right base. Ultimately a diagnosis of abscess of the lung and bronchiectasis was made.

A bronchoscopic examination revealed a mass of granulation tissue about 1 cm. in diameter within the right bronchus near its termination, about 5 cm. from the carina to the right and in front. The center of this mass exuded pus and it bled slightly when touched but appeared to be soft in consistency.

At a later bronchoscopic examination the abscess cavity was irrigated. The granulation tissue nearly disappeared and an apparently hard white mass was seen protruding from the abscess cavity. Microscopic examination of a section removed showed adenocarcinoma.

Radium was then applied but the patient died of bronchopneumonia, the cancer growing rapidly after the biopsy.

At autopsy the right lung was found to be firmly bound by old adhesions. At the second bifurcation of the right bronchus was a solid polypoid tumor mass measuring 2 by 4 cm. which arose from the bronchial mucosa and wall and projected above into a dilated bronchus. A purulent bronchitis was present in both lungs. Sections showed the tumor to be a very cellular adenocarcinoma with an area of squamous-cell growth. It probably arose from the bronchial mucosa. There were no metastases.

ROSCOE C. WEBB, M.D.

HEART AND VASCULAR SYSTEM

Schmidt, F.: Intracardial Injections (Ueber die intrakardialen Injektionen). *Orvosi hetil.*, 1921, lxv, 361, 372.

The author gave intracardial injections in the cases of fifteen moribund patients with inoperable diseases. He used camphor, caffeine, strophanthin, adrenalin, pituitrin, digitalis, and strychnin. In the last cases only strophanthin and adrenalin in small doses were employed, either alone or in combination. The mixture consists of 0.2 to 0.3 c. cm. of strophanthin, 0.1 to 0.2 c. cm. of adrenalin solution, and 2 to 3 c. cm. of sterile, distilled water.

The fluid must be injected slowly, as rapid injection may cause tetanic spasm of the heart,

causing it to stop in systole. An overdose does harm. The injections may be repeated only when the dose is too small or the drug is changed. In the injection the following regions are to be avoided: the walls of the auricle and ventricle and the dividing septum, the region of the His-Tawara bundle, Spangaroff's region (the upper and middle thirds of the anterior part of the anterior longitudinal sulcus), the base of the heart, the openings of both venæ cavæ, and the posterior part of the auriculoventricular dividing wall. Schmidt sought the apex of the left ventricle.

The injection always stimulated the heart action and in some cases maintained it for as long as three days. Many patients regained consciousness.

The indications are: acute arrest of the heart's action, when slight respiration persists and the drug cannot be given effectively in any other way because of inadequate circulation of the blood; heart weakness following severe illness; collapse; cases of poisoning (chloral hydrate, toxins) in which the strength of the heart has not yet been exhausted by the drugs; severe syncope in narcosis; severe collapse due to loss of blood (the purpose in such cases being to gain time for infusion); and lightning stroke, injury from electricity, and exposure to intense cold.

VON LOBMAYER (Z).

Hedblom, C. A.: The Treatment of Pericarditis with Effusion. *Minnesota Med.*, 1922, v, 40.

Inflammatory exudation in pericarditis suggests infection and, with rare exceptions, this is probably always present. The most frequent cause of primary pericarditis is the infective organism of acute articular rheumatism. Other primary disease conditions commonly associated with it are pleurisy, pneumonia, the acute general infections, tuberculosis, and chronic nephritis. In young children and infants suppurative pericarditis seems to be largely a complication of pleurisy and pneumonia.

Clinically, pericarditis with effusion is classified usually as serous, hæmorrhagic, or purulent, or as some combination of these types of exudates. Of 100 cases with necropsy records at the Mayo Clinic since 1910 twenty-one were acute fibrous, twenty adhesive or obliterative, twenty-seven serous, twenty-one purulent, and four hæmorrhagic.

The most characteristic symptoms are increased precordial dullness, feeble or absent heart sounds, absent apex impulse, a small rapid pulse, dyspnoea, and cyanosis. Occasional signs are dysphagia, precordial pain, pulsus paradoxus, and recurrent nerve paralysis. Downward displacement of the liver and dullness in the left side of the back may also be found. The onset may be insidious and the symptoms latent. Exploratory pericardiocentesis may be necessary to establish the presence of fluid and to determine its nature. A negative aspiration does not exclude the presence of fluid.

Exploratory pericardiocentesis with a short hypodermic needle which infiltrates the tissues with novocaine as it enters is as simple and painless as ex-

ploratory aspiration of the pleural cavity. The point of election for aspiration seems to be in the region of the left mammary line, the fifth interspace, just inside the left border of dullness. In case aspiration here is negative, alternate points are beneath the xiphoid process at the left sternal border and at the right sternal border in the fifth interspace.

A serous effusion is usually sterile, but may be infected. A purulent exudate is usually infected, but it may be tuberculous or secondary to malignant disease. A sterile exudate, except the persistently recurring type, should be evacuated by aspiration through a small short needle. An infected exudate should be evacuated by pericardiectomy after preliminary resection of the cartilage to secure wide open dependent drainage.

Pericardiectomy with drainage is indicated in cases of non-tuberculous purulent effusion. It is indicated also to establish the diagnosis when exploratory aspiration has failed and in cases with large effusion embarrassing the heart in which aspiration fails to evacuate a sufficient amount of fluid to relieve the pressure.

Because of anatomic variations in the reflection of the left pleura, a transpleural operation may be unavoidable. In suppurative pericarditis, however, the leaves of the pleura are probably adherent and therefore wall off the pleural cavity.

To secure the most efficient drainage and prevent possible encapsulation of exudate behind the heart the most dependent parts of the pericardial cavity on each side of the vena cava must be reached.

As it promotes evacuation of the exudate, irrigation seems to be a rational measure supplementary to drainage.

On account of the severity of the primary disease conditions with which especially purulent pericarditis is associated, the mortality rate will probably remain relatively high; it may be reduced materially, however, by the earliest possible diagnosis, prompt evacuation of exudate causing mechanical embarrassment to the heart, and wide-open adequate drainage in the infected type of the disease.

L. H. FOWLER, M.D.

PHARYNX AND ŒSOPHAGUS

Henrard, E.: The Extraction of Foreign Bodies from the Œsophagus and the Upper Respiratory Passages (Extraction des corps étrangers de l'œsophage et des voies aériennes supérieures). *Arch. méd. belges*, 1921, lxxiv, 897.

Henrard has extracted a coin from the cricoid stricture of the œsophagus under X-ray control in fifty-five cases.

The screen control method has been assailed as a blind method because the œsophagus is not visible; the contents is seen but not the container. Henrard points out that œsophagoscopy is also a blind method as it will not reveal the lower part of a foreign body in the œsophagus.

When a foreign body is arrested above the cricoid stricture an attempt should be made first to remove it under screen control. If this fails, its extraction by means of the œsophagoscope should be attempted. If this fails also, external œsophagotomy is indicated.

If the foreign body has not passed the aortic stricture of the œsophagus, extraction under screen control should be tried first, and if this fails the œsophagoscopic method should be attempted or the foreign body pushed down to the cardia.

If the body is in the lower third of the œsophagus it should be extracted through the cardia after gastrotomy. No attempt at extraction from above should be made in this case as it would be attended by the danger of bringing the foreign body to the aortic stricture from which it might be impossible to extricate it.

In cases of foreign bodies in the upper respiratory tract (trachea, bifurcation of the bronchi) the bronchoscopic method seems indicated, but is very difficult. In Henrard's opinion it would be better to attempt extraction under screen control. In certain cases of bronchial foreign bodies it is necessary to make a thoracic flap opening. The foreign body may then be removed under screen control.

W. A. BRENNAN.

Ballin, M., and Saltzstein, H. C.: Perforations of the Œsophagus; Report of a Case of Transpleural Œsophageal Fistula. *Surg., Gynec. & Obst.*, 1922, xxxiv, 42.

The authors report a case of transpleural œsophageal fistula developing during lobar pneumonia and accompanied by pyopneumothorax in which ingested food was discharged through the thoracic drainage opening. The perforation healed spontaneously after many months. They have been able to find in the literature the reports of only six cases in which the œsophagus perforated into the pleural cavity without communicating with the trachea, bronchi, or lungs. These cases are abstracted.

The literature contains the reports of œsophageal perforation due to congenital malformation, neoplasms, aneurisms, œsophageal instrumentation, surgical, stab, and gunshot wounds, foreign bodies, spontaneous rupture, acute œsophagitis, diverticula, simple or peptic ulcer, and luetic ulcer, and tuberculosis. The authors discuss these causative conditions.

J. D. ELLIS, M.D.

Van Wildenberg, L.: Diverticula of the Pharynx and Œsophagus (Les diverticules du pharynx et de l'œsophage). *Bull. Acad. roy. de méd. de Belg.*, 1922, 5 s., ii, 20.

There are two types of œsophageal diverticula: diverticula due to traction and pressure and propulsion diverticula. Van Wildenberg's case was of the latter type and was probably congenital as the condition was present at birth.

When a diverticulum is suspected its presence or absence can be determined definitely by catheteriza-

tion or X-ray examination. By these means also not only the volume of the diverticulum but also the depth to which it descends in the mediastinum can be determined. In all clearly diagnosed cases surgical operation is indicated. The dangers of operation are the opening of the diverticulum, failure of suture, opening of the œsophagus, and mediastinal infection. To prevent such complications Mayo fixes the diverticulum to the skin and delays its removal until a barrier of protective granulations has been formed in the mediastinum. Other operators have invaginated the diverticulum, but the dangers to respiration contra-indicate this method.

Van Wildenberg, following the suggestion made

by Schmidt in 1912, dissected the sac and did a diverticulopexy, affixing the fundus of the sac in the most elevated part of the wound. He has performed this operation in seven cases. In three he ultimately removed the sac. There were six recoveries and one death. The first cases were operated upon in 1917. In Van Wildenberg's opinion it is best to do the diverticulopexy first. The patient may then be allowed to go home and after eight days will feel perfectly well. Fifteen days to three weeks later the pocket should be excised and the pharyngeal wound sutured. The last case treated, that of a man aged 56 years, is described in detail and illustrated.

W. A. BRENNAN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Lerche, W.: Insufficiency (Eventration) of the Diaphragm; with the Report of a Case and the Surgical Treatment Thereof. *Surg., Gynec. & Obst.*, 1922, xxxiv, 224.

Cases of abnormally high diaphragm have been reported in the literature as cases of "paralysis of the diaphragm," "phrenic paralysis," "true hernia of the diaphragm," "eventration of the diaphragm," etc. "Insufficiency of the diaphragm" is an appropriate term for this condition. It may be congenital or acquired. Reference is made to two cases of the congenital type reported in the literature.

Acquired insufficiency may be either acute or chronic. It is due to a lesion of the phrenic nerve or degenerative changes in the musculature of the diaphragm. Barbano cites thirty-eight cases due to degenerative changes in the nerve and musculature following infectious fevers such as pneumonia, typhoid, diphtheria, etc. Traumatic fracture or luxation of the spinal column, spondylitis, spinal hæmorrhage, tumor of the spinal cord or mediastinum, tuberculous bronchial glands, etc. may affect the phrenic nerve in a similar manner. Muscular changes in the diaphragm, such as pseudohypertrophic lipomatosis, myositis, and degenerative atrophy, have also been observed. Dilatation of the colon and stomach by pressure may produce this condition.

Acute insufficiency of the diaphragm may follow an acute infection, persist for a few weeks, and then disappear. Chronic insufficiency of the diaphragm includes the cases in which the diaphragm is permanently disabled. A case of this type reported was that of a woman, 37 years old, who for twelve years following a violent coughing spell with choking due to a bit of cornflake lodged in the larynx, had coughed up a part of any liquid swallowed. Œsophagoscopic examination revealed an opening in the anterior part of the œsophagus 19 cm. from the incisor teeth, which communicated with the trachea. This was verified by bronchoscopic examination. Fluoroscopy and X-ray examination of the stomach and chest showed the heart to be pushed to

the right. Barium was seen to pass from the œsophagus into the bronchi, and the stomach and colon were found to be higher than normal, extending to the third interspace on the left. These viscera occupied a dome-shaped gas-filled space which gave a tympanic percussion note on this side of the chest. The differential diagnosis between diaphragmatic hernia and insufficiency was difficult. It was decided to repair the diaphragmatic condition, regardless of the type of the lesion, before a plastic closure of the œsophagotracheal fistula was made.

At operation through a left rectus incision diaphragmatic insufficiency was found; the sac-like dilatation contained the dilated, rotated stomach and colon. The diaphragm was pulled down and pleated twice to form a triple layer of tissue.

Suppuration of the bronchial lymph nodes followed by ulceration and rupture into the œsophagus was regarded as the cause of the œsophagotracheal fistula and the involvement of the phrenic nerve. When lung tissue can be seen through the gas-filled stomach it is a point strongly in favor of hernia, but in the case reported this fact was of no value in the differential diagnosis between diaphragmatic hernia and insufficiency.

The value of the operation described has not been determined, although seven months later the symptoms had markedly decreased, the patient had gained in weight and was able to work, and it seemed unnecessary to attempt the repair of the œsophagotracheal fistula.

MERLE R. HOON, M.D.

Cullen, T. S.: A Method of Dealing with Intestinal Loops Densely Adherent to an Umbilical Hernia. *J. Am. M. Ass.*, 1922, lxxviii, 564.

After dissecting the sac free from the fascia until the outer layers of the hernial ring are exposed on all sides Cullen makes a small longitudinal incision through the fascia and peritoneum just above the ring. A finger having been inserted as a guide, the hernial ring is cut loose and the sac is lifted well away from the abdominal wall and packed off.

If the sac contains omentum only and this is densely adherent, the incarcerated portion is tied

off and removed with the sac. If the omentum is free, the ring is closed by the overlapping method.

If intestinal loops are contained in the sac, the latter is opened from the neck outward. Occasionally the loops of intestines must be dissected away from the sac wall, a procedure which leaves many bleeding points on the bowel.

The author reports a case of umbilical hernia of eighteen years' duration in a man of 68 years. The first operation was done in 1908 by the overlapping method. The patient made a rapid recovery and was well for ten years. A protrusion then appeared at the site of the old hernia and obstruction occurred. A second operation was performed under procaine anæsthesia. The sac contained many loops of adherent bowel so densely attached that liberation was out of the question. The loops were separated from each other by dissection, thirty to forty patches of sac being left adherent to the intestinal loops. These loose edges were carefully trimmed off with the scissors. The patches were smooth and did not bleed. The ring was closed by the overlapping method. The patient recovered, and three years after the second operation is perfectly well.

By leaving these patches on the bowel much time was saved. The patches served to protect the bowel, and there was no bleeding or raw surface to cause subsequent intestinal obstruction.

The condition of the hernia and intestines in different stages of the operation is illustrated by three sketches.

C. F. ANDREWS, M.D.

Farr, R. E.: Closure of Large Hernial Defects in the Upper Abdomen. *Surg., Gynec. & Obst.*, 1922, xxxiv, 264.

Farr reports the histories of three cases of repair of the abdominal wall with fascial flaps from the chest.

A vertical incision is made over the sternum and the sheath of the pectoral muscles exposed as high as the nipple line. A quadrangular flap, 10 in. long, with its base below, and composed of pectoral fascia and a considerable amount of muscle, is dissected downward until a flap approximately 6 in. in width has been raised. The flap is then sutured over the hernial opening.

The lower portion of the thorax is an ideal area from which to procure a pedicled flap as the protection of the ribs furnishes adequate insurance against the weakening of this area by the cutting of the flap. If flaps can be obtained without too greatly reducing the strength of the area from which they are cut, the pedicled flap method may be effectually applied to hernia in any part of the abdominal wall.

H. A. McKNIGHT, M.D.

GASTRO-INTESTINAL TRACT

Ruben, M. A.: Multiple Primary Carcinomata of the Pylorus and of the Ectopic Gall-Bladder. *Surg., Gynec. & Obst.*, 1922, xxxiv, 201.

The case reported is unique in that the patient received surgical treatment at one operation for

primary carcinoma of two organs. It is of interest also because the location of the tumors possibly supports the theory that mechanical lesions cause the development of malignant growths and because the location and the ligamentous connections of the gall-bladder were unusual.

The patient was a woman 67 years of age who gave a history of four weeks of light pain on the right side of the abdomen coming on spontaneously or induced by coughing and who presented a round fist-sized tumor, movable with respiration, to the right and below the umbilicus. The lungs, heart, liver, spleen, kidney, and pelvis were negative. A smaller tumor was palpable just behind the first one. No ascites was present and there was no history of jaundice. Gastric analysis and X-ray examination of the ileum, cæcum, and colon were practically negative. A probable diagnosis of cystic tumor of the mesocolon was made.

At operation the larger tumor was found in the transverse mesocolon close to the hepatic flexure. The gall-bladder could not be located in its normal position. The cystic tumor was found to be connected with the duodenum by a duct in the hepaticoduodenal ligament. In the upper part of the tumor were hard particles the size of a hazel nut. A pyloric carcinoma was found on the greater curvature.

About 20 cm. of the transverse colon were resected and the bowel joined by side-to-side anastomosis. A resection of the stomach was done, both ends were closed, and an anterior gastro-enterostomy with a Braun entero-anastomosis was performed.

The patient reacted satisfactorily and her condition at first seemed favorable, but five days later signs of peritonitis developed and death occurred on the eleventh day.

Pathologic examination showed the larger tumor to be a papillomatous carcinoma and the other a typical medullary carcinoma of the stomach. From the difference in their macroscopic and microscopic appearance, it was evident that the growths were distinct primary tumors.

In the literature the frequency of primary carcinomata has been given as 2 to 3 per cent. Very rarely three primary carcinomata have been found in the same patient. Billroth emphasized certain points in the diagnosis of primary tumors as contrasted with metastatic tumors. He did not accept as primary any growth which did not show a definite histologic structure, which could not be traced histologically to the epithelium of the matrix, and which did not show a metastasis. In order to group the tumors according to their location Bauer has proposed the following scheme: (1) one organ or system of organs; for instance, the stomach and rectum; (2) symmetrical organs—breasts and ovaries; (3) different systems of organs—skin and rectum.

The author calls attention to the presence in a small percentage of cases of a ligamentous connection between the neck of the gall-bladder and the transverse mesocolon. Spalteholz called it the "ligamentum hepaticocolicum."

The article is closed with the suggestion that the case reported supports the theory that some mechanical injury is responsible for starting malignant new growths. In this case the gall-bladder was abnormally movable and by its connection with the pylorus a continuous stretching and chronic irritation of the pylorus was produced. MERLE R. HOON, M.D.

Guillaume, A. C.: The Prognosis in Acute Intestinal Occlusion (Le pronostic dans l'occlusion intestinale aigue). *Presse méd.*, Par., 1921, xxix, 822.

This article is a statistical study of the mortality of intestinal occlusion. In 3,829 cases operated upon in the last thirty years the mortality was 63.2 per cent. In cases operated upon previous to 1900 it was 66 per cent, and after that date fell to 52 per cent. This decrease Guillaume attributes partly to better surgery, but especially to earlier diagnosis.

Of a series of 543 cases, 143 were malignant and had a mortality of 64.3 per cent, while in the remaining 400 in which the occlusion was due to diverse causes the mortality was 56.7 per cent.

The prognosis in various types of cases is discussed in detail with tables of statistics, and there is a particularly inclusive comparative discussion of the published statistics of intussusception in the different periods of life. The author notes particularly the gravity of intestinal obstruction due to biliary calculus.

The mortality of ileus is compared with that of strangulated hernia, and the lower mortality of the latter condition is explained as due entirely to earlier diagnosis.

The article is illustrated by tables and five charts.

C. L. HARTSOCK, M.D.

Johnson, R.: Carcinoma of the Jejunum and Ileum. *Brit. J. Surg.*, 1922, ix, 422.

Johnson excludes from his discussion growths involving the duodenum and the ileocaecal valve. He draws attention to the remarkable rarity of both primary and secondary growths in the duodenum and to the fact that malignancy is much less rare in the lower part of the ileum than in the upper part of the jejunum.

Three cases are reported in this article, one a case of polypoid growth occurring 18 in. below the duodenojejunal flexure, the second, a case in which a ring-like growth was present about 3 or 4 ft. below the duodenojejunal flexure, and the third, a case in which a ring-like growth was found about 6 in. above the ileocaecal valve.

A correct diagnosis was not made in any of these cases before operation. An important clinical sign was visible peristalsis of the small bowel. In the third case the distention of the bowel with fluid contents suggested the presence of free peritoneal fluid.

Symptoms emphasized by the author as characteristic of carcinoma of the jejunum and ileum are abdominal pain, vomiting, increasing constipation, and rapid wasting. The duration of the symptoms is variable. Carcinoma of the small intestine has been

diagnosed before operation as carcinoma of the stomach, duodenal ulcer, strangulated hernia, and intestinal obstruction due to a peritoneal band.

If there is no obstruction the operative treatment consists in the removal of the growth and the glands draining it. If marked obstruction is present the author forms an artificial anus in a first-stage operation and removes this anus with the growth soon afterward in a second-stage operation.

From the standpoint of pathology, growths of the small intestine are of four varieties: (1) the stenosing ring-like form; (2) the polypoid form; (3) the ulcerative type; and (4) the colloid type. Multiple growths have been found. Metastases are frequent and usually develop in the mesenteric glands, the peritoneum, and the liver. Histologically the growths are carcinomata with columnar, spenoidal, or polyhedral cells.

Mention is made of growths termed "carcinoids," which are similar in nature to the basal-cell carcinoma of the skin. Carcinoids arise in the basal cells which lie between the cylindrical cells of the crypts of Lieberkuehn and are found in the intestine and appendix. Tumors of similar structure may arise from pancreatic rests. M. R. FLYNN, M.D.

Goullioud: Gastro-Entero-Anastomosis without Turning of the Jejunal Loop (De la gastro-entéro-anastomose sans retournement de l'anse jejunaie). *J. de chir.*, 1922, xix, 137.

Goullioud states that in performing a gastro-enterostomy the majority of French surgeons make a turn in the jejunal loop. As a result, the food coming from the stomach and progressing from left to right continues to discharge into the intestines in the same direction. This method is termed "isoperistaltic gastro-enterostomy."

Goullioud does not twist the jejunal loop but preserves the left-to-right direction by making what he calls a direct anastomosis between the stomach and the jejunum very near the ligament of Treitz.

Following removal of the transverse colon and exposure of the mesocolon, Goullioud finds the beginning of the jejunum, opens the mesocolon in an avascular area near its base, and through this opening seeks the point in the posterior surface of the stomach where he wishes to make the anastomosis. He then forms a fold in the stomach with a Doyen forceps and a similar fold on the duodenum as near as possible to the ligament of Treitz. The anastomosis he makes with three rows of sutures. As a rule its proximal extremity is about two finger-widths from the ligament of Treitz but sometimes it is closer. The two sides of the mesocolon breach are fixed to the gastric wall immediately beneath the anastomosis in order to prevent herniation of the small intestine into the posterior omental cavity and deviation of the anastomosis due to dragging of the stomach. The anastomosis is made near the greater curvature and is almost transverse.

This type of gastro-enterostomy rests upon an anatomical basis. The duodenum has a left oblique

direction beginning at the ligament of Treitz. The jejunum deviates to the right so that when the anastomosis is made at a distance from the ligament of Treitz the jejunum has a natural direction to the right and it is necessary to turn the jejunal loop as in the isoperistaltic gastro-enterostomy.

Goulioud does not lay claim to innovation. The short-loop method is attributed to Patersen who in 1901 found that it prevented circulus vitiosus. Hochenegg described the method in 1897. Roux employed it in 1898 and abandoned his Y-method. Mayo also strongly recommends the formation of the anastomosis near the Treitz ligament. He insists on the left direction of the duodenum at its beginning as this prevents a vicious circle and chronic regurgitation of bile.

W. A. BRENNAN.

Davis, D. L., and Poynter, C. W. M.: Congenital Occlusions of the Intestines; with Report of a Case of Multiple Atresia of the Jejunum. *Surg., Gynec. & Obst.*, 1922, xxxiv, 35.

The authors present a brief historical review of the more important articles dealing with the subject and report a case of multiple jejunal atresia.

There seems to be no point in the intestinal canal where atresia appears with any constancy, and in such a short segment as the duodenum the lesion may occur at any point. In a series of 234 cases studied, atresia developed in the ileum and cæcum in 101 cases, in the duodenum below the papilla in seventy-five, and above the papilla in fifty-nine, in the jejunum in sixty, and in the colon in thirty-nine. Of sixty-seven cases of multiple atresia, there were from two to nine occlusions in the jejunum and upper ileum in slightly more than 50 per cent, occlusions of the small intestines and colon in 20 per cent, and scattered occlusions in the remainder.

Emesis almost always occurs and usually begins on the second day of life. Hæmatemesis may be present, appearing frequently with the first emesis. Bile may be vomited even if the obstruction is above the papilla. Constipation is usually complete, but small amounts of a grayish mucus may be noted when the obstruction is below the papilla, and small green movements may occur when the obstruction is above the papilla. In some cases slight icterus or anuria may be present.

Errors of development, congenital volvulus, intussusception, and strangulation of a loop of intestine at the umbilicus or some other point are all to be considered as possible etiological factors in the production of the lesion. Little support of the theory of foetal peritonitis as a cause of atresia is given by the results of examination of the authors' material, most of the evidence indicating that the primary lesion was in the arteries, causing a sclerosis, and that the degeneration of the mucosa was secondary to this sclerosis.

The diagnosis of the intestinal obstruction generally presents little difficulty, but localization of the lesion is difficult and is usually made too low in

the canal. Multiple atresia cannot be diagnosed. The treatment is surgical. The authors advise entero-anastomosis under procaine anæsthesia.

The case of multiple atresia reported was that of a child five days old who had had symptoms of intestinal obstruction for two days before the time of operation, when an external enterostomy was done at the site of an occlusion of the ileum. Death occurred six hours after the operation. Postmortem examination showed the jejunum to be composed of several segments blind at both ends and from 1 to 17 cm. in length. The arteries of the mesentery appeared normal on macroscopic examination, but showed sclerosis on microscopic examination of the regions in which hiatus occurred. The process appeared to be primary in the smaller radicles, and the authors believe that it cannot be classed as a developmental anomaly.

GEORGE H. JACKSON, M.D.

Magoun, J. A. H., Jr.: Dilatation of the Colon Simulating Hirschsprung's Disease. *Surg., Gynec. & Obst.*, 1922, xxxiv, 198.

Hirschsprung divided cases of Hirschsprung's disease into two types, true megacolon occurring in infancy, and pseudomegacolon occurring in adults. Magoun classifies them into three groups, as follows:

1. The congenital type or true Hirschsprung's disease: (a) occurring in infancy or early life, (b) in which obstinate constipation, abdominal distention, and emaciation have been present since birth, but the patient has reached adult life.

2. Cases in which chronic constipation has been present for years and the symptoms of Hirschsprung's disease developed within a short period without demonstrable mechanical obstruction.

3. Cases of megacolon due to mechanical obstruction, such as: (a) those occurring in infancy and due to atresia or stenosis of the rectum, (b) those occurring in adult life and due to tumors, volvulus, adhesions, inflammatory stenosis, or external pressure on the bowel.

The author reports the case of a man 36 years of age which falls into the last group, the cause being a carcinomatous papilloma in the first part of the descending colon. Although the patient was constipated from childhood, obstinate constipation had been present for only two years. During this period he had complained of occasional cramp-like pains. The X-ray demonstrated a dilated colon. At first, a modified Brown operation was performed. At the end of five months the patient had gained 35 lbs. and was free from pain. At the second operation, the lower portion of the ileum, the cæcum, appendix, and the colon to a point below the growth were removed and the ileum and colon joined by end-to-end anastomosis. Convalescence was uneventful.

The pathologic findings in this case were similar to those of true Hirschsprung's disease and in addition there was a carcinomatous papilloma of the ring-type. The muscular layers of the colon were markedly hypertrophied. MERLE R. HOON, M.D.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Willis, A. M.: *The Relative Merits of the "Ideal Cholecystotomy," Cholecystectomy, and Cholecystostomy.* *Surg., Gynec. & Obst.*, 1922, xxxiv, 183.

Gall-bladder cases are divided into two groups. The first comprises the acute cases and those with long-standing severe pathology. Many of the persons so affected are elderly and obese, and in some cases there may be complications. When the abdomen is opened disease of the gall-bladder is distinctly apparent. Although cholecystectomy seems indicated, the author advises cholecystostomy because of: (1) the disastrous results which sometimes attend cholecystectomy in these cases, (2) the fact that a secondary operation is not always needed but if it is necessary is more often possible following cholecystostomy than following cholecystectomy, and (3) the fact that often a gall-bladder which appears to be hopelessly diseased will recover a surprising amount of functional ability following cholecystostomy. Though dense adhesions are produced, they are a minor discomfort.

The second group of gall-bladder cases consists of those with mild or vague symptoms, little local change, and slight damage to vital organs—cases in which it is sometimes difficult to tell whether or not the gall-bladder is diseased even on inspection. The author believes that in these cases cholecystostomy, which causes the formation of dense adhesions, will often produce more discomfort than the original trouble, and that therefore cholecystectomy without drainage is the operation of choice.

Among other functions, the normal gall-bladder stores and concentrates the bile. While patients whose gall-bladders have been removed are relieved of their symptoms and resume their normal lives, it cannot be proved that they have not suffered some obscure disturbance of function. Therefore the promiscuous sacrifice of gall-bladders in such conditions as cholelithiasis without the presence of infection is to be deplored. For these, in properly selected cases, the old operation of "ideal cholecystotomy," abandoned many years ago, is urged. With the improvements in diagnosis and operative technique, this procedure seems indicated for cases in which it is impossible to make a definite diagnosis, the gall-bladder being often normal in appearance. Under such circumstances cholecystectomy is not justified, and a cholecystostomy would result in adhesions.

This statement applies also to cases of silent stone discovered on X-ray examination of the gastro-intestinal tract or at operation in which there is no history of gall-bladder disturbance or there has been at most only a mild, recurring epigastric distress. Silent calculi, acting as foreign bodies, may be causes of infection but do not justify either cholecystectomy or cholecystostomy.

O. S. PROCTOR, M.D.

Delore, X., and Wertheimer, P.: *Enterobiliary Anastomoses, Cholecysto-Enterostomy and Cholecystogastrostomy* (Les anastomoses entérobiliaires, cholécysto-entérostomie et cholécysto-gastrostomie). *Rev. de chir.*, Par., 1921, xl, 400.

The introductory paragraph of this article traces the development of the different types of anastomosis during a period of thirty years.

Bile may be drained from the gall-bladder to the exterior through a permanent channel or by means of an anastomosis of the gall-bladder with a part of the digestive tract, the stomach, small intestine, or colon. The authors describe the chronological development of the different types of anastomosis, dealing first with the purely theoretical side and then with the successful development of the operative technique in man. Bibliographies are included.

Because of the ease of its exposure, its mobility, and the fact that it is generally found dilated, the gall-bladder is the usual site of anastomosis. Nevertheless, both experimentally and in man the hepatic duct, and more often, the common duct have been used. In twenty-one anastomoses done in Kehr's clinic, the gall-bladder was employed in twelve and the hepatic duct in nine. Other cases have been reported in which choledochoduodenostomies were performed. In one instance a rubber prosthesis was used as a means of effecting anastomosis. In the very great majority of reported cases, however, the anastomoses were made with the gall-bladder.

Because of the normal physiological processes of digestion the duodenum is the natural site for the anastomosis, but its lack of mobility and its partial covering by peritoneum, in addition to the complicated technique of a cholecystoduodenostomy, have led to the development of other types of operation—cholecystojejunostomy, cholecysto-enterostomy, cholecystogastro-enterostomy. The last-named operation is the simplest and the one to be preferred.

Cholecystostomy is a simple temporary method for the evacuation of gall-stones, stones in the common duct, and infected bile. It is used also in cases in which immediate drainage is indicated as a temporary measure. However, in cases of retention of bile and distention of the gall-bladder due to a neoplasm, carcinoma of the pancreas, or extrinsic compression, cholecystostomy with exterior drainage is inconvenient, is apt to cause a secondary infection leading to many metabolic disturbances, and in many instances leaves permanent fistulae necessitating a secondary intervention. By the diversion of bile from the intestinal tract alimentary metabolism is disturbed, intestinal motility is lessened, and the physiological reactions are affected.

Anastomosis eliminates these inconveniences and also prevents the damages which result from icterus, but it should be performed at a time when the simplest type of operation is needed.

Anastomosis with the first portion of the duodenum gives the most nearly normal function, yields satisfactory clinical results, and is less liable to set

up infection, but the operative technique is very difficult. Anastomosis with the jejunum is less satisfactory, and anastomosis with the transverse colon interferes with digestion and the metabolic processes and has the highest risk of infection. However, the probability of infection is not as high practically as theoretically.

Cholecystogastro-enterostomy has been shown to be satisfactory both from a physical and a physiological standpoint. The former belief that bile in the stomach retarded the digestion of the albumins and impaired the gastric secretions has been disproved clinically and experimentally. It is pointed out that cholecystogastro-enterostomy is the operation of choice because of the satisfactory clinical and operative results and the simplicity of the operative technique.

The authors review seventeen cases, giving the history, diagnosis, operation, operative findings, postoperative developments, and the end-results. In this group there were twelve cholecystogastro-enterostomies, three cholecystocolostomies, and two cholecystojejunum-enterostomies with no operative deaths. The cases were followed for varying periods after the operation.

For all the operations preliminary exploration is recommended. This should include special examination of the gall-bladder region, separation of the adhesions, and careful selection of the sites of anastomosis. In cases of distended gall-bladder or numerous stones, the gall-bladder should be emptied. The technique and the different steps in the operations are given in detail. Cholecystogastro-enterostomy is strongly advocated.

Operative intervention is indicated in the following types of cases:

1. Cases of complete or incomplete occlusion of the common duct with dilatation of the gall-bladder and retention of bile.
2. Cases of hydrops of the gall-bladder with obliteration of the cystic duct, whether the cause of the condition is known or not.
3. Cases of multiple or single biliary calculi in which there is obstruction of the cystic or the common duct and the gall-bladder wall has not been greatly damaged.
4. Cases of non-calculous obliteration of the common duct, whether this is caused by a congenital malformation or by a neoplasm of the biliary ducts, the pancreas, or more extensive involvement.

The authors' conclusions are as follows:

1. Cholecystogastrostomy ought to be considered the typical biliary anastomosis.
2. It should be done in preference to repair when the case demands rapid intervention.
3. It entails the least operative risk and causes no disturbance of the physiological digestive processes and no complicating infections.
4. It is indicated in chronic icterus when obstruction or pressure on the gall-bladder by neoplasms has occasioned retention with distention of the bladder. This indication is limited only by the

possibility of excision or the patient's general condition.

5. It is utilized with advantage in the treatment of certain cases of icterus, the cause of which it is difficult to determine, and in the treatment of biliary fistulae if the condition of the gall-bladder warrants anastomosis.

6. A certain degree of bladder distention is necessary for the establishment of cholecystogastrostomy. Because of this fact the operation is indicated especially in cases of lithiasis, for aged patients, for those whose general condition is precarious, and for cases of occlusion of the common duct which require complex operative manoeuvres.

7. This operation may be classified as a palliative measure. The unexpected successful results which it has sometimes given depend upon errors of diagnosis and the curability of the inflammatory lesions. But even in cases in which the development of an obliterating tumor means death, this operation is often the cause of a temporary amelioration which may be of considerable duration.

8. In all of these cases there is improvement of symptoms. Disappearance of itching and a decrease of the icterus are always observed, and frequently there is an arrest of the cachexia.

W. O. JOHNSON, M.D.

Hartman, F. L., Smyth, C. M., Jr., and Wood, J. K. W.: *The Results of High Ligation of the Cystic Duct in Cholecystectomy.* *Ann. Surg.*, 1922, lxxv, 203.

The experiments reported were carried out upon a series of ten dogs. In each case the length and diameter of the cystic duct were measured and the gall-bladder was removed close to its neck. One dog died during the operation. The remainder were chloroformed and subjected to autopsy at intervals varying from six weeks to fourteen weeks after the operation. In seven, the cystic duct stump was dilated quite markedly and filled with bile. In another, a bud-like dilatation filled with bile was found at the end of the cystic duct stump. In some, the cystic duct stump was increased in length.

On histologic examination of a section from these newly formed bladders all the coats of the gall-bladder could be recognized.

In one dog in which the cystic duct was cut off practically flush with the common duct there was no dilation of the small stump, but a marked dilation of the common and hepatic ducts was found. In two of the eight cases with dilation the bile had become inspissated and apparently was beginning to form calculi. Under the microscope these dilations suggested chronic catarrhal cholecystitis. It seemed evident that the dilated duct did not have the power to force the bile out.

Two clinical cases of dilation of the cystic duct stump observed by Deaver and Stewart are reported.

The conclusions drawn are as follows:

1. When a cystic duct stump is left, it usually dilates to form a pseudo-gall-bladder; hence there

may be a recurrence of symptoms after a cholecystectomy.

2. When the cystic duct is ligated flush with the common duct there is general dilation of all ducts, indicating pressure in the biliary system.

3. The gall-bladder is not essential to life, but it seems to have a very definite function in storing bile and acting as a tension bulb regulating pressure in the biliary system.

4. The fact that after the removal of the gall-bladder the body attempts to restore the normal condition in the biliary system through dilation of the ducts and the stump of the cystic duct indicates that the gall-bladder has a definite function.

CARL R. STEINKE, M.D.

Willis, A. M.: Some Problems in Connection with the Surgery of the Biliary Tract. *Ann. Surg.*, 1922, lxxv, 196.

The successful treatment of gall-bladder disease depends on an accurate diagnosis. This diagnosis is difficult even when we have as aids the complete history, a careful physical examination, a roentgenological examination, the use of the duodenal tube and magnesium sulphate, and abdominal exploration.

The number of removed gall-bladders showing only simple cholecystitis as compared with those showing cholecystitis with calculi is cited. From this comparison Willis is inclined to believe that the surgeon of the present day is apt to infer the presence of gall-bladder disease from any discomfort in the upper part of the abdomen. When the diagnosis has been made the decision as to what should be done to the gall-bladder surgically is not as easy as it was formerly. The conditions which clearly indicate cholecystectomy are malignancy, hydrops, cicatricial closure of the cystic duct, and the strawberry gall-bladder.

The choice of cholecystostomy and drainage of the gall-bladder instead of cholecystectomy is based on:

1. The function of the gall-bladder in digestive processes as shown by: (a) the concentration of the bile, and (b) storage of the bile.

2. The increased surgical risk of cholecystectomy when the patient is debilitated.

3. The presence of dense adhesions and a contracted and thick-walled gall-bladder.

4. The good results obtained from cholecystostomy in seemingly functionless gall-bladders.

5. The lessened chance of injury to adjacent structures in cholecystostomy.

6. The fact that conditions following cholecystostomy are more favorable for secondary operations if the latter are necessary.

The author does not agree with the accepted theory that severe cases of gall-bladder involvement should be treated by cholecystostomy and drainage and mild cases by cholecystectomy. The removal of the gall-bladder in cases showing moderate or mild symptoms evidencing a low-grade cholecystitis

is based on the poor results obtained by cholecystostomy and drainage and the results in animal experimentation which showed: (1) that when sterile bile is allowed to escape into the peritoneal cavity dense adhesions are not formed and the action of the bile is not lethal; (2) if a foreign body is inserted the adhesions become very dense and numerous; (3) if infection is introduced, the bile plus a foreign body plus infection causes very dense adhesions and often leaves a pericholecystitis as severe as that preceding the operation.

Leakage of bile after the removal of the gall-bladder is rare and drainage can be dispensed with to a great extent. In thirty-eight cases treated by cholecystectomy without drainage in a period of five years, and in a later series of seventy-two cases in which there were two deaths there was no bile leakage. In the removal of the gall-bladder in the milder cases of gall-bladder disease it is better not to use drainage, as in this way the formation of dense adhesions can be avoided.

The "ideal cholecystotomy" as performed by Meredith in 1883 has been severely condemned. This opposition should be overcome by our advancing technique in surgery. The omission of drainage following the ideal cholecystotomy is no more radical than the omission of drainage following the removal of renal calculi, cholecystectomy, operations for perforating duodenal ulcer, and choledochotomy.

As an adjunct to cholecystotomy and the removal of calculi following the ideal operation, the non-surgical drainage of the gall-bladder by Lyon's method would seem full of promise. In this manner a definite class of cases might be relieved of the gall-bladder syndrome with preservation of the organ.

GEORGE E. SUTTON, M.D.

Banting, F. G., and Best, C. H.: The Internal Secretion of the Pancreas. *J. Lab. & Clin. Med.*, 1922, vii, 251.

In reading an article on the relation of the isles of Langerhans to diabetes which gave a résumé of degenerative changes in the acini of the pancreas following ligation of the ducts, the idea presented itself to the authors that since the acinous, but not the islet tissue, degenerates after this operation, advantage might be taken of the fact to prepare an active extract of islet tissue. A subsidiary hypothesis upon which the experiments here reported were based was that trypsinogen or its derivatives is antagonistic to the internal secretion of the gland.

From the investigations of different observers it may be concluded: (1) that the secretion produced by the acinous cells of the pancreas is in no way connected with carbohydrate utilization; (2) that injections of whole-gland extract have been useless as a therapeutic measure in defects of carbohydrate utilization; and (3) that the islands of Langerhans are essential for the control of carbohydrate metabolism. According to one investigator there are two possible mechanisms by which the islets might accomplish this control: (1) the blood might be

modified while passing through the islet tissue, that is, the islands might act as detoxicating stations, and (2) the islets might produce an internal secretion.

The authors believe that the experiments herein reported demonstrate that the latter mechanism is in operation. The majority of their experiments were performed upon female dogs which were completely depancreatized at the initial operation. The pancreatic tissue removed after seven to ten weeks' degeneration showed an abundance of healthy islets and a complete replacement of the acini by fibrous tissue.

In the course of the experiments over seventy-five doses of extract from degenerated pancreatic tissue were administered to ten diabetic animals. Since the extract has always produced a reduction of the percentage sugar of the blood and the sugar excreted in the urine, the authors feel justified in stating that this extract contains the internal secretion of the pancreas. While they have always observed a distinct improvement in the clinical condition of diabetic dogs after the administration of extract of degenerated pancreas, they state that it is very obvious that the results of their experimental work do not as yet justify the therapeutic administration of degenerated gland extracts to clinical cases of diabetes mellitus.

The results of the experimental work reported may be summarized as follows:

Intravenous injections of extract from the pancreas of the dog removed from seven to ten weeks after ligation of the ducts invariably exercised a reducing influence upon the percentage of sugar in the blood and the amount of sugar excreted in the urine.

Rectal injections were not effective.

The extent and duration of the reduction varied directly with the amount of extract injected.

Pancreatic juice destroyed the active principle of the extract.

That the reducing action is not a dilution phenomenon was indicated by the following facts: (1) hæmoglobin estimations before and after the administration of the extract were identical; (2) in-

jections of large quantities of saline did not affect the blood sugar; (3) similar quantities of extracts of other tissues did not cause a reduction of blood sugar.

Extract made 0.1 per cent acid was effectual in lowering the blood sugar.

The presence of extract enabled a diabetic animal to retain a much greater percentage of injected sugar than it would otherwise.

Extract prepared in neutral saline solution and kept in cold storage retained its potency for at least seven days.

Boiled extract had no effect on the reduction of blood sugar.

GEORGE E. BEILBY, M.D.

MISCELLANEOUS

Lamas, A., and Prat, D.: Hydatid Cysts of the Abdomen Simulating Ascites: Preperitoneal Hydatid Cysts (Kystes hydatiques de l'abdomen à type ascitique—Kystes hydatiques préperitoneaux). *J. de chir.*, 1922, xix, 15.

The authors have operated upon two cases of hydatid cysts which clinically suggested abdominal ascites due to tuberculosis. There was a large, progressive, and diffuse abdominal distension which upon examination seemed to have all the characteristics of distension due to fluid. Digestive disturbances from visceral compression, œdema of the lower extremities, evidence of collateral circulation, and profound intoxication were present.

At operation in each instance an enormous amount of fluid was evacuated. In some cases this was purulent. Escaping in the fluid were numerous small cysts in various stages of degeneration. The wall of the cavity containing this fluid was external to the abdominal cavity. Beneath the thickened posterior wall the intestines could be seen.

Heretofore the origin of the large cysts was supposed to be preperitoneal because they are situated between the muscles of the abdominal wall and the peritoneum. On the basis of their studies, however, the authors have come to the conclusion that they originate directly from the peritoneum.

LOYAL E. DAVIS, M.D.

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Tillier, R.: The Individuality of the Metaphysis (De l'individualisme de la métaphyse). *Rev. d'orthop.*, 1922, xxix, 21.

From the point of view of evolution the long bone has three distinct parts: the diaphysis, the metaphysis, and the epiphysis. The individuality of the metaphysis is revealed in the examination of the long bones of young subjects in the period of growth. The juxta-epiphyseal or metaphyseal region possesses an anatomical individuality which is of particular importance in pathology. Tuberculosis

is localized most frequently in the epiphysis, syphilis in the diaphysis, and osteomyelitis in the metaphysis. These points are illustrated by roentgenograms. In Tillier's opinion the point of union between the diaphysis and metaphysis plays a rôle in the pathogenesis of certain malformations and traumatic lesions.

W. A. BRENNAN.

Stephan, R.: Polyperiostitis Hyperæsthetica (Polyperiostitis hyperaesthetica). *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1921, xxxiv, 201.

Within the last three years Stephan has observed five cases of a disease that he is unable to classify. By some authors the condition has been ascribed to

a tuberculous infection of the skeletal system. Stephan suspects a systemic disease of the entire periosteum. The course is chronic in limited periods, and in the beginning there are very long intervals of latency. Almost always there is a subfebrile rise of temperature. In the later stages the condition, which is doubtless an inflammatory process, becomes generalized over the entire skeleton.

The histories of the five cases observed by the author are given in detail. Two were cases of the fully developed and generalized disease, one was a case in which the disease was progressive but not yet very extensive, and the two others were cases in which the condition was in a very early stage. The five patients were females.

The typical findings of the condition, especially in the first two cases, were:

1. Thickening of the periosteum which caused a very dense shadow in the X-ray picture. This was present in only certain of the diseased portions of the body. The bone itself was unchanged in marrow and cortex. In the first case the specimen obtained at operation showed a hard callous tissue of periosteal fibers containing few cells or vessels, that is, a periosteal tissue with simple proliferation, without or with only slight inflammation.

2. Hyperæsthesia of the skin and soft parts which was unusually marked, extended far beyond the periosteal focus, and was manifested at the slightest touch of the hair-pencil or the finger tip without any pressure on the deeper tissue.

The author regards the hyperæsthesia as a clinical analogue to Head's zones in disease of the internal organs, but it is more widespread and extension does not occur necessarily by segments or by nerve roots. It can be explained as due to radiation of the sensation of pain from the nervous region of the periosteum to that of the skin and soft parts by an indirect route through the spinal centers. Polyneuritis and associated inflammatory involvement of the skin and soft parts can be excluded. Spontaneous pain of a dull boring character may also be present. There is further an extreme power of reaction of the subcutaneous cellular tissue in the form of widespread infiltration and later of slow formation of hard callus to subcutaneous injections of drugs. This was the case when preparations of tuberculin were employed, but especially following the use of acriflavine and silver salvarsan. The subfebrile rise of temperature occurs particularly in the evening and at the time of the formation of new periosteal foci.

In the first two cases, which were observed over a long period, the disease extended, with interruptions in its progress, throughout the entire skeleton.

The author refuses to accept tuberculosis, syphilis, infectious rheumatism, or polydermatomycosis as the cause. The exciting factor is still to be discovered as the disease cannot be brought into line with those due to known excitants. The cases are too few to warrant deductions as to the prognosis, but the affection appears to be chronic and has a

tendency to progress. Numerous drugs (acriflavine, silver salvarsan, colloid preparations of silver, urotropin, etc.) have no effect upon it. Hydrotherapy with mud baths, fango packs, and treatment with radiant heat are of value to alleviate the symptoms. Minimum doses of X-ray treatment have been found beneficial. When the disease is circumscribed, surgical intervention appears to be indicated and should be radical.

As a term for the new disease the author suggests "polyperiostitis hyperæsthetica." SONNTAG (Z).

Young, J. K., and Cooperman, M. B.: Von Recklinghausen's Disease or Osteitis Fibrosa. *Ann. Surg.*, 1922, lxxv, 171.

This article reports the case of a 21-year-old colored girl with immense solid bone tumors involving the upper and lower jaws, cystic tumors in the right and left humeri, pathologic fractures in the femora with vicious union, extreme muscular atrophy, and severe deformities of the pelvis and spine. The X-ray showed marked decalcification of the skeleton and typical osteitis fibrosa.

The authors believe that osteitis fibrosa, including benign bone cysts, giant-cell sarcoma of the epulis type, hæmorrhagic osteomyelitis, and von Recklinghausen's disease, is a distinct pathologic entity characterized by a fibrous metaplasia of bone.

Two types of the disease are recognized: a local and a general type. As a rule, local osteitis fibrosa and benign bone cysts are dependent upon trauma. The general form is dependent upon grave nutritional disturbances. Disturbances of endocrine glands, faulty calcium metabolism, and low-grade chronic infections seem to be of etiological importance.

Cysts, osteitis fibrosa, and giant cells may occur in the same bone. The giant-cell content is not prognostic of malignancy.

The diagnosis of osteitis fibrosa is based upon the long duration of the process with very vague symptoms, the frequency of spontaneous fractures, and the findings of X-ray examinations. Very often microscopic examination of pathologic specimens is necessary to clear up the diagnosis.

The local form of the disease is benefited by curettage and bone transplantation. The type showing multiple lesions must be given constitutional treatment directed toward the underlying constitutional disturbance. If the lesion be accessible, curettage and bone transplantation may be employed. The X-ray and radium have been used in these cases with some success.

PHILIP LEWIN, M.D.

Kisch, E.: Errors of Diagnosis in Tuberculosis of the Bones and Joints (Fehl Diagnosen bei Knochen- und Gelenktuberkulose). *Arch. f. klin. Chir.*, 1921, cxviii, 481.

The author calls attention to the extraordinary frequency of incorrect diagnosis in tuberculosis of the bones and joints. The radiation of the pain is often an important factor. Cases of tuberculosis of

the knee are treated for a long time as cases of flat-foot. A painful knee joint is treated for a long period with massage and hot air when the real trouble is tuberculosis of the hip.

In the differential diagnosis of tuberculous arthritis the chief diseases to be considered are gonorrhœa, lues, and rheumatism. The principal clinical difference between gonorrhœa and tuberculosis is the pain. Tuberculosis of the wrist, knee, elbow, or shoulder, which is gradual in onset, is usually not very painful, but in tuberculosis of the knee and hip there may be considerable pain. In gonorrhœal arthritis pain develops early and is severe. The onset of a gonorrhœal joint metastasis is sudden. The day when the disease appeared is usually given with exactness. In tuberculosis the roentgen picture shows atrophy and the structure of the bony trabeculae is particularly distinct, while in gonorrhœa the bone picture is less distinct.

In lues of the joints the chief forms to be considered are the synovial forms. If the lesions are congenital there is almost always bilateral joint involvement. Bilateral joint disease in a child is usually luetic. Acquired lues of the joints can be easily confused with a fungus or hydrops tuberculosis because a chronic course, swelling of the capsule, and progressive contraction, particularly of the knee joint, are common to both. The fluid obtained by puncture of a tuberculous joint, in contrast to that obtained from a syphilitic joint, is very flocculent. Acquired syphilitic arthritis appears usually on one side only, a fact which renders the differential diagnosis more difficult. The Wassermann test, not the roentgen picture, is the decisive factor. It is important to remember that disease of the sternoclavicular joint is very frequently luetic; also that tuberculous spina ventosa, like lues, often begins with a slight periosteitis. In such cases the diagnosis is often decided by the presence of tuberculous or luetic foci in other areas.

In the joint affected by chronic rheumatism and the tuberculous joint there is a gradual development of symptoms—swelling, pain, limitation of function, and effusion—but a flocculent exudate speaks for tuberculosis. Absolute certainty is given by animal inoculation with the fluid obtained by puncture.

There is often great difficulty in the diagnosis of tuberculosis of the shaft, particularly in distinguishing it from suppurative osteomyelitis. The onset of the latter is usually acute and associated with rigor, while tuberculous osteomyelitis as a rule runs a chronic course without any rise of temperature. Osteomyelitis is accompanied by pain, inflammation, and loss of function. In tuberculous disease of the bone marrow these are absent. In the latter there are usually other tuberculous foci in the bones. As a rule the roentgen picture is of little help in differentiating tuberculosis of the shaft and osteomyelitis. Thickening of the periosteum is as marked in tuberculosis of the shaft as in ordinary osteomyelitis because the condition is particularly rapid in its involvement of the surrounding tissues. The X-ray

shows, however, that in tuberculosis there is atrophy of the cortex. It shows also that the sequestrum of tuberculosis is considerably smaller than that of osteomyelitis, its margins are finely serrated, it is of a rounded, very delicate structure, and it usually presents the same degree of atrophy as the surrounding bone. The sequestrum of osteomyelitis is usually large, long, spear-shaped, and without atrophy. In these cases also animal inoculation with the pus is decisive. The differential diagnosis is of great practical importance as a cure of tuberculous osteomyelitis is effected with great certainty by means of heliotherapy or treatment with iodine.

Kuettner distinguishes tuberculosis arising primarily in the marrow of the diaphysis from that which involves the marrow canal secondarily to disease of the joint or foci in the spongiosa. With regard to Bier's treatment of tuberculosis this division is of secondary importance.

The article is very well illustrated and contains a description of tuberculosis of the shaft in which, particularly in reference to Bier's treatment, the author discusses the processes of healing as they appear clinically and in the roentgen picture.

The differential diagnosis between osteitis fibrosa and the honeycomb form of tuberculosis of the shaft is also interesting. Involvement of the soft parts or an abscess shadow indicates that the lesion is tuberculous. The differential diagnosis between tuberculous coxitis and Perthes' disease may often be made from the clinical examination. Limping is caused by both conditions. In Perthes' disease limitation of abduction of the hip with normal flexion is characteristic. In tuberculosis of the hip there is limitation of motion in all directions. In Perthes' disease pain is frequently absent; in coxitis it is usually present. The injection of tuberculin may be of value. КОСЯ (Z).

Hartman, F. W.: Synovial Membrane Tumors of Joints. *Surg., Gynec. & Obst.*, 1922, xxxiv, 161.

Synovial membrane tumors of tendon sheaths are easily recognized but their pathology is very puzzling as is evident from the variety of terms applied to them: granuloma, myeloma, myeloid tumor, myeloxanthoma, myeloid endothelioma, fibro-angioma, giant-celled tumor, giant-celled xanthosarcoma, and benign xanthic extraperiosteal tumor of the extremities containing foreign body giant cells.

The tumor growths in joints are readily classified into three groups: (1) pedunculated tumors, (2) diffuse tumors with giant cells, and (3) diffuse tumors without giant cells.

The author cites four cases in the first group, four cases in second group, and nine cases in third group, giving the clinical histories, the pathologic findings, and cuts showing cross-sections and gross sections of some of the tumors removed.

Hartman's discussion is as follows:

"The occurrence of these tumors in joints and especially in the knee joint raises at once the problem of saving the limb and the function of the joint.

Their development is slow as a rule and ample warning is always given in the form of pain, swelling, and interference with function. They are readily removed if attacked in the early pedunculated stage, without danger of local recurrence or remote metastases.

"As to classification, it seems best to place them with the benign tumors of connective-tissue origin since the giant cells are of the foreign-body type and no mitosis is seen. However, there is a potential malignancy as demonstrated in the patients of Lejars and Rubens, of Kruger, and of Garré. Palliative measures and incomplete excision are contra-indicated and are perhaps responsible for the malignant characteristics developed in these cases.

"These neoplasms should not be termed 'sarcoma,' at least until evidences of malignancy are seen either clinically or pathologically. Since any one of the characteristic cells, namely xanthoma or foam cells, pigmented cells, and giant cells, may be absent from an otherwise typical case, the writer prefers the name used by Woodhead, 'myeloid tumor.'"

F. W. CARRUTHERS, M.D.

Burke, G. T.: A Case of Gumma of the Vertebrae.
Med. Press, 1922, n.s. cxlii, 112.

A Sepoy, 23 years old, was admitted to the hospital complaining of pain in the back and weakness in both legs which had been present for one month. Physical examination revealed a fluctuating mass on the right border of the sternum. When opened, this was found to be a caseating gumma eroding through to the posterior wall of the bone.

The spinal movements were normal. The generalized hypotonicity of the spine combined with localized stiffness, which has been so much emphasized by some observers as pathognomonic of luetic involvement of the vertebrae, was not noted. Absence of systemic nerve involvement in bone syphilis, as stressed by Abrams, Wile, and others, was borne out by the absence of cranial nerve involvement and of Argyll-Robertson pupils.

In the lower extremities all signs pointing to upper motor neurone paraplegia, such as slight wasting, exaggerated reflexes, brisk ankle clonus, the Babinski sign, and a spastic gait, were present. The blood and spinal fluid gave a four plus Wassermann reaction.

In three weeks the picture changed to that of a lower motor neurone lesion with loss of sphincter control and of all deep reflexes. Energetic salvarsan treatment given intravenously and by the Swift-Ellis method was followed by marked relief and the return of sphincter control. This improvement was only temporary, however, for cystitis soon developed and death ensued four months after the date of the patient's admission to the hospital.

Autopsy revealed a swelling the size of a golf ball on either side of the body of the eighth dorsal vertebra and containing $\frac{1}{2}$ oz. of pus and cheesy material. The body of the vertebra was eroded anteriorly and laterally, and through a small opening the caseous tumor communicated with the spinal

canal. The meninges at this level were thickened with granulated tissue $\frac{1}{2}$ in. thick. Pathologic examination of the tumor around the cord demonstrated the structure of a gumma. A microscopic examination of the cord section was not made.

This case is of particular interest because of the location of the gumma. The vast majority involve the cervical region.

The statistics as to the incidence of gumma of the vertebrae vary greatly, ranging from 3 per cent of cases of syphilis chosen at random in a medical clinic by Baldwin to the sparse single cases scattered throughout the literature. DAVID TELSON, M.D.

Eaves and Campiche: Note on a Malformation of the Carpus. *J. Bone & Joint Surg., 1922, iv, 78.*

The authors report a case of congenital deformity of both wrists as follows:

The patient's left hand is rather small and the fifth finger is curved toward the radius. All the movements of the wrist are very extensive. Especially, adduction of the hand toward the radial side is much greater than in a normal subject. The X-ray shows that the navicular bone is about one-half the normal size and the styloid process of the radius is absent.

In the right hand there is a marked prominence of the base of the first metatarsal toward the volar surface and the muscles of the thenar eminence are quite thin. The thumb is small and markedly curved, its concavity being toward the ulna. The right index finger is similarly curved. The fifth finger shows a curve with its concavity toward the radius. The lateral movement of the wrist toward the radial side is very extensive. The X-ray of the right wrist shows total absence of the navicular bone and poor development of the styloid process of the radius.

The patient has also a mild hypospadias and an abnormal growth of hair. The radial pulse is in the middle of the wrist on both sides.

As a rule carpal deformity is associated with severe malformations of the hand or forearm.

WILLIAM A. CLARK, M. D.

Dupont, I.: Old Coxofemoral Arthritis Probably of Typhoid Origin (Ancienne arthrite coxo-fémorale probablement d'origine typhoïdique). *Rev. d'orthop.*, 1922, xxix, 61.

Dupont's case of partial ankylosis of the hip due to non-suppurative arthritis is illustrated by a roentgenogram. The partial ankylosis was caused by an osseous articular and peri-articular reaction of the hip. The patient had a febrile affection which was at first diagnosed as influenza and later as typhoid. An abscess formed in the ischio-rectal fossa. When the patient left the hospital he had a motor disturbance in the left leg (psoriasis). This was treated by mechanotherapy but became permanent.

The author states that in typhoid fever articular lesions are more infrequent than diaphyseal lesions.

W. A. BRENNAN.

Maragliano, D.: The Treatment of Contractures of the Knee Due to Arthritis by Partial Infiltration of the Sciatic Nerve with Alcohol (Il trattamento delle contratture artrogenerie del ginocchio coll'alcoolizzazione parziale dello sciatico). *Chir. d. organi di movimento*, 1921, v, 659.

Maragliano treats exclusively of contractures of the knee in flexion which are due to inflammatory processes and in which a certain mobility persists in that it is possible to increase the flexion already present to a greater or less degree. Generally a tenotomy or tendon lengthening eliminates the muscular contraction, but in some cases contraction is re-established by cicatricial adhesions of the tendon stumps.

It seems to Maragliano therefore more logical to supplement the corrective procedures by some direct action on the innervation of the flexors in order to decrease the centripetal stimulus and the energy of contraction. Such direct action may be obtained by partial infiltration of the sciatic nerve with alcohol.

The injection cannot be made into the principal trunk of the sciatic nerve as in such case the alcohol might diffuse in the different fasciae and cause permanent paralysis of muscles of the leg with resulting deviation of the foot.

Maragliano states that at the level of the lower margin of the gluteus maximus the nerve fibers going to the head of the biceps, the semitendinosus and semimembranosus muscles, and the dorsal portion of the adductor magnus are united by a common fascia which can easily be isolated at this level from the great sciatic nerve. The isolation is facilitated also by the fact that at this point the fascia referred to has its own sheath.

The use of alcohol to eliminate a condition of hyperkinesia in a group of muscles is not new. Sicard and Imbert employed it with good results in the treatment of muscular contractions due to war wounds and it has been used also by others.

Sixty per cent alcohol is best. In this concentration it interrupts the sensory conductivity of the nerve without altering its motor conductivity. In two clinical cases reported by the author which resisted the usual treatment good and lasting results were obtained by this method. W. A. BRENNAN.

Hicks, E. P.: Hereditary Perforating Ulcer of the Foot. *Lancet*, 1922, ccii, 319.

The signs of hereditary perforating ulcer of the foot appear early, at about the fifteenth year of age. The first signs are a callus on the great toe which soon changes to an ulcer. The ulcer heals under ordinary treatment but soon re-appears. At first there is no pain, but as the disease spreads and progresses the pain becomes very severe. Besides local pain there are darting pains in different parts of the body. The outstanding feature other than ulcer formation is deafness which appears in the later stages. The disease is progressive and shortens life. In all the author's cases there was a distinct

hereditary history of such a condition. Practically all of the reflexes of the lower extremity were gone and there was absence of sensation to heat and cold over a large area of the foot and leg.

The conclusions drawn are as follows:

1. The disease is distinctively hereditary. Its main symptoms are perforating ulcer of the feet, shooting pains in various parts of the body, and deafness.

2. It is progressive and shortens life.

3. It corresponds to no disease previously described, but bears some resemblance to syringomyelia.

F. W. CARRUTHERS, M.D.

FRACTURES AND DISLOCATIONS

Kreuscher, P. H.: The Management of Fractures Near Joints. *Illinois M. J.*, 1922, xli, 88.

The author states that emphasis should be placed upon the fact that too long fixation is often the cause of non-union, and that traction should be applied, and all reductions and fixations should be effected, under the control of the fluoroscope. Aspiration is indicated when there has been bleeding into a joint as it favors fixation. If infection has occurred the frequent injection of 2 per cent each of apothesine and formalin in glycerine is advisable, the former to prevent pain. If the blood has become clotted, the joint must be opened and the clot removed mechanically.

Ninety-five per cent of fractures of the humerus involving the shoulder joint require open reduction and fixation. Because of the possibility of infection such operative procedures should be delayed until the tenth day. A strict Murphy-Lane technique is of importance. Kreuscher advises fixation by means of a metal splint such as the Lane plate and staples. He mentions also the Smith bone clamp.

Bone grafting in the vicinity of joints and in the shafts of the bones is never indicated unless it is evident that normal healing will not occur.

Most elbow fractures can be reduced with the aid of the fluoroscope. If misplacement has occurred, however, open reduction and fixation by means of screws, nails, or pegs are necessary. In fractures of the internal condyle early manipulation is inadvisable as it has a tendency to promote callus formation and troublesome exostoses.

With regard to fractures of the neck of the femur the author states that good results have been obtained by the Whitman method of extreme abduction but he, himself, uses Murphy's method. Except in cases of impaction, the patient is placed in a Travois abduction splint with Buck's extension of from 10 to 15 lbs. on the affected limb. This is done on the day of the accident or as soon thereafter as possible. It relieves pain, prevents absorption due to involuntary muscular contraction, and places the fractured bone ends in the best position.

In a large number of the cases bony union is prevented by the interposition of joint capsule. Because of the importance of the hip as a weight-bearing joint,

an open operation through an incision giving direct access to the neck of the femur is justified whenever the patient's physical condition makes this possible.

After the large adductor muscles have been pushed aside the site of fracture is inspected and any muscle or portion of the capsule which may have become interposed is removed. The fractured ends having been approximated, a long screw or nail may be driven into the head through the greater trochanter and the neck in such a way as completely to fix the fragments. Some surgeons use the bone transplant driven through an opening made through the neck into the head, but in Kreuscher's opinion this is superfluous and hazardous unless one is reasonably sure that regeneration would not take place by natural processes. Because of the decrease in the blood supply and because of conditions favoring absorption of the neck, it is necessary to immobilize in the abducted position considerably longer than in other fractures about the joints.

Traumatic arthritis may involve joints distant from the site of fracture. As a means of relieving such conditions Kreuscher suggests early traction.

JOHN DUNLOP, M.D.

Nutter, J. A.: On Delayed and Non-Union of Fractures. *J. Bone & Joint Surg.*, 1922, iv, 104.

Speaking broadly, a time limit of six to twelve months may be placed on delayed union. After this, if the fracture has not united, the case may be considered as a case of non-union. Statistics of various authors indicate that the incidence of non-union is 2 or 3 per cent. Certain bones seem to have a predisposition to delayed and non-union; e.g., the humerus between the middle and upper thirds, the femur in the middle third and the neck, and the tibia and fibula in their lower thirds.

A substantial proportion of cases of delayed union and non-union seen at Buxton Hospital were found to be syphilitic and responded to anti-luetic treatment. In some of these cases this disease acted locally, producing gummatous deposits, but general experience indicates that its influence on fractures is systemic. Numerous febrile diseases, cachexia, nephritis, tabes, and diseases of the ductless glands have been regarded as causes of non-union but their importance is theoretical rather than practical. Local causes, although less numerous, are of more importance than general causes. Extensive loss of substance due to over-zealous débridement has been encountered as a factor preventing union principally in military surgery. It can be obviated by lessening the extension and allowing the bone ends to come together. Overriding is probably never a cause of non-union but may delay consolidation. Interposition of soft tissues and incomplete immobilization are quite frequent causes. Sepsis, if virulent enough to cause bone necrosis and sequestration, may delay union, but mild infections tend to stimulate rather than hinder callus formation. In some cases the only apparent reason for non-union is extreme density of the bone, e.g., after osteotomy done with

a saw for bowlegs. The use of metallic plates and screws sometimes results in osteoporosis at the fragment ends. In this manner a gap is formed which is obliterated only by the removal of the plate.

A diagnosis of delayed union is justified if motion is present at the site of fracture after the usual time required for the union of bone. Non-union is to be diagnosed only after six to twelve months of unsuccessful effort to obtain union.

The treatment of delayed union is ordinarily conservative. Non-union requires operation. If delayed and non-union are to be prevented, bones with recently healed fractures, especially weight-bearing bones, must not be put to work too soon, splints must not be removed too early, and the surgeon must not be too eager to examine or test the fracture. If a case of simple fracture of the femur ununited at ten weeks shows good alinement and length, proper immobilization, and an adequate blood supply, it should be let alone. As a rule solid union will result. If union is still delayed after three months, conservative treatment should be begun. The percussion and damping treatment with Bier's hyperæmia originated by Thomas is an old and reliable method. Baking, massage, and baths in running aerated hot water cause an active hyperæmia and encourage callus formation. The injection of iodine, alcohol, and other irritants may promote the growth of fibrous tissue but is of no value in producing bony union. Drilling down into the bone ends through a skin puncture is a logical procedure in that it liberates a greater number of osteoblasts, thus stimulating new bone formation. The physiological stimulus of function hastens union, especially in the lower limbs.

For non-union in aseptic cases with loss of substance bone grafting is the method of choice to bridge the gap. If there is no gap the operation should be as simple as possible. After preliminary direct skeletal traction for overriding, the bone ends should be exposed, the fracture surfaces freshened, and sclerosed bone drilled. Absorbable material should be used for fixation. In ununited fractures of the femoral neck, which occur in about 80 per cent of cases, a bone peg is to be preferred to a metal spike. The peg should be left rough in order that the maximum number of osteoblasts may be preserved, and its periosteum should be removed so that there will be no barrier between the graft and the host bone. Bone grafting seems to be more successful in the larger bones than in the smaller ones such as the radius and ulna, probably because of the proportion of the trauma to the size of the bone. The method of choice for tapered bone ends consists in splitting them and engaging the graft between the split ends.

Sepsis is not, as formerly supposed, a cause of non-union. War experience showed that abundant callus forms in the presence of pus and that if the fragments are in apposition union takes place readily. Pus is a contra-indication, however, to internal fixation of any kind. To avoid encounter-

ing latent infection in old ununited fractures, six to twelve months should be allowed to elapse after healing before a fixation operation is undertaken. Even then it is best to do the work in two stages. In the first stage the bone fragments should be exposed and the bed prepared for the graft. After ten days, if no infection has resulted, the graft may be inserted and the wound closed.

A comprehensive bibliography supplements this article.

WILLIAM A. CLARK, M.D.

Wilmoth, P.: Congenital Dislocation of the Shoulder — Congenital Malformation of the Shoulder (La luxation congénitale de l'épaule — malformation congénitale de l'épaule). *Rev. d'orthop.*, 1921, 35, viii, 617.

The scapulohumeral articulation may be congenitally malformed. In such cases dislocation of the humeral head may occur in a perfectly normal labor without trauma.

A similar clinical picture is presented by obstetrical paralysis due to trauma. In this group of cases the brachial plexus may be involved in its entirety or in only its upper or lower portion. Each lesion gives rise to its typical clinical picture.

Only two methods of treating a congenitally dislocated shoulder are rational. If function is not completely lost and internal rotation of the humerus is not exaggerated, good results may be obtained from massage, electrical treatment, and mobilization. In other cases osteotomy is indicated.

LOYAL E. DAVIS, M.D.

Schaefer, H.: The Effect of Rotation Movements upon the Total Function of the Elbow Joint and Its Importance in the Treatment of Fractures (Ueber den Einfluss der Rotationsbewegungen auf die Gesamtfunktion des Ellenbogengelenks und ihre Bedeutung fuer die Frakturbehandlung). *Arch. f. orthop. u. Unfallchir.*, 1921, xx, 22.

The author discusses the action of the individual muscles of the forearm upon motion at the elbow joint. The change in function of the individual muscles resulting from different positions of the joint corresponds to a disturbance of the innervation of both main groups of extensors and supinators, viz., the radial nerve and the flexors and pronators, the musculo-cutaneous, median, and ulnar nerves.

The mechanism of the joint shows also the interdependence of the partial joints since rotation movements are accompanied by movements of flexion and extension, and flexion and extension movements are accompanied by movements of rotation. Rotation movements can therefore maintain the capsule and the flexor and extensor muscles in function to a certain degree even when the elbow joint is fixed. For this reason rotation movements should be made from the very beginning in cases of fracture of the elbow, dressings should be carried up only to the middle of the arm, and the flexed position should be changed every six days.

HELLER (Z).

Bizarro, A. H.: A Comparative Analysis of 213 Forearm and Leg Fractures. *Ann. Surg.*, 1922, lxxv, 221.

In reviewing 105 forearm fractures the author found that the most common causes were the back-firing of motors and falls and that approximately 75 per cent of such fractures occurred between the ages of 10 and 30 years.

The radius alone was broken in seventy-four cases, the radius and ulna in sixteen, and the ulna alone in fifteen cases.

Of the single radial fractures, fifty-six of the seventy-four were fractures of the lower half of the bone. The lower half of the lower third of the radius is the point least resistant to trauma. The transverse fractures are most common, oblique fractures next most common, and longitudinal cracks least common. The majority of the fractures are complete. The incomplete or green-stick fractures are more common at the upper half of the lower third.

Of the fifteen single ulnar fractures, six were in the olecranon, two in the coronoid, two in the upper third below the coronoid, two in the middle third, and three in the lower third. The olecranon is therefore the most common point of fracture. In three cases the olecranon fracture was incomplete. The tip of the ulnar styloid was broken in 13 per cent of the single fractures of the ulna, and the radial styloid in 5 per cent of the single fractures of the radius.

Of the sixteen fractures of the radius and ulna, 60 per cent occurred in the lower third of the bones.

The lower end of the radius is the most common site of "chauffeur's fracture," the lower epiphyseo-diaphyseal line being the most common level. It is difficult to explain why in some of these cases only one bone was broken while in others both were fractured. The factor responsible appears to have been the position and amount of wrist abduction at the time of the back-firing.

There were four cases of epiphyseal separation due to back-firing, and two due to falls on the hand. The swelling was diffuse and there was an ecchymosis at the front or the back of the wrist.

There were four cases of reversed Colles or Goyrand fracture, two of which were due to back-firing, and two due to falls on the hand with the wrist flexed.

In the cases reviewed there were only three classic Colles fractures. One of these required forcible wrenching to reduce the impacted fragments.

Fractures of the bones of the leg occurred in 118 cases. Twenty-five were due to slipping or to twisting or spraining of the ankle, twenty-one to falls, and the remainder to various injuries received during sports, etc. Most of these fractures occurred during the second and third decades of life.

Of forty-two single fractures of the fibula, thirty-four (80 per cent) were in the lower two-thirds of the lower third, three were in the upper third of the lower third, four were in the middle third, and one was in the upper third. The direction of the frac-

ture was usually oblique, although at the distal end of the bone the transverse fracture is more common.

Thirty-eight per cent of the fractures of the fibula and malleolus were of the incomplete variety.

Of the twenty-one cases of fracture of the tibia alone seven were in the lower third of the lower third (malleolar), eight in the upper third of the lower third, two in the middle third, and four in the upper third (two of the tubercle and two of the outer tuberosity).

There were fifty-two cases of fracture involving both the tibia and fibula. The lower tibial third was fractured in 88 per cent of these cases. The upper half of the lower third of the tibia appears to be the most fragile part of the bone. Almost one-half of the fractures at this level were of the spiral type.

Summarizing the series of tibial and fibular fractures, it is seen that fracture of both bones was more common than fracture of either of them alone. The malleolar fracture was the most common, especially in the fibula. Fracture of the upper half of the lower tibial third was practically always accompanied by fracture of the fibula.

Classic Pott's and Dupuytren's fractures were comparatively rare in this series.

DANIEL H. LEVINTHAL, M.D.

Kraus, A.: A New Case of Congenital Luxation of the Head of the Radius (Un nuovo caso di lussazione congenita del capitulo del radio). *Polidlin.*, Rome, 1922, xxix, sez. prat., 8.

Kraus reports a case of congenital forward luxation of the head of the left radius of a girl 10 years of age. The diagnosis was made after examination of successive roentgenograms.

Such an anomaly is not rare as 118 cases have been reported in the literature and in somewhat more than half of these the condition was bilateral. Sixty-five cases showed a backward luxation; thirty-seven, a forward luxation; eleven, an outward luxation; and five, a downward luxation. Seventy-five per cent of the subjects were males.

In the author's case examination of the roentgenograms shows alteration in the radio-ulnar interosseous membrane, increased laxity, structural deformities in the radio-ulnar and humeroradial ligaments, and over-development of the radial tubercle which is raised so as to form a triangle with an apex of about 145 degrees. This over-development of the tubercle has not been reported previously. The radius is somewhat longer than normal.

W. A. BRENNAN.

Cohen, I.: Dislocation of the Pisiform. *Ann. Surg.*, 1922, lxxv, 238.

The author reports the case of a boy, 11 years old, who fell and struck his left hand, suffering a backward displacement of the lower epiphysis of the radius and a forward and slightly upward displacement of the pisiform bone.

On examination, the pisiform bone could be palpated at a higher level than normal and was distinctly moveable. Without anaesthesia an attempt was made to reduce the epiphysis. A small gauze pad was then strapped over the pisiform bone with adhesive pulling distally, and the wrist was put up in flexion. A second X-ray examination showed that the epiphysis was only partially reduced but the pisiform was in place. Ten days later passive motion was begun. At this time the pisiform was less moveable than at the previous examination, but more moveable than normal. By the fifteenth day function was rapidly returning.

There have been only nine cases of pisiform dislocation reported in the literature up to the present time. Six of these antedated the X-ray.

The cause of dislocation of the pisiform may be either a direct blow or muscular violence.

DANIEL H. LEVINTHAL, M.D.

Froelich: The End-Results of the Treatment of Congenital Dislocation of the Hip by Non-Operative Reduction (Les résultats éloignés dans le traitement des luxations congénitales de la hanche par la réduction non sanglante). *Rev. d'orthop.*, 1921, 35, viii, 451.

Froelich reports a series of ninety-eight cases of congenital dislocation of the hip ten years after non-operative reduction. In 75 per cent of these cases reduction was perfectly maintained. Roentgenograms were used to check these findings. Until puberty the X-ray may show changes in the femoral head and neck suggesting a true coxa vara. At the time of puberty transitory pain or slight contractures may occur in the affected hip. At this time also a painful arthritis may develop with superficial destruction of the femoral head. The latter condition is probably due to tuberculosis.

Of seventeen other cases operated upon ten or more years previously one-third showed a perfect anatomical and functional result. In some cases with a perfect functional result, however, there were changes in the head or the neck of the femur such as thickening, depression, and coxa vara.

The author favors a simple method of treatment. After reduction he maintains the limb in a position of abduction and flexion for four months by means of a plaster cast. This same position is then kept for one month without the aid of a cast. Finally, after a roentgenographic examination, walking is begun at the sixth month and the patient's activity is gradually increased.

LOYAL E. DAVIS, M.D.

Gazzotti, L. G.: The Hahn-Codivilla Bone Graft (Contributo allo studio del trapianto osseo alla Hahn-Codivilla). *Polidlin.*, Rome, 1921, xxviii, sez. chir., 548.

In 1883 Hahn implanted a pedunculated graft of the fibula into the tibia, inserting one end into the medullary part of the upper tibial stump and leaving the lower end free. Later modifications concerned chiefly the fixation of the lower part of the graft to

the lower tibial stump. Codivilla performed the entire operation in one stage.

In a case of pseudarthrosis of the left tibia due to a gunshot injury the author cut a section of the fibula 16 cm. long, inserted its upper part into the medulla of the proximal stump of the tibia, and fixed its distal end to the lower stump by means of a metal strip.

Seventy days later the X-ray showed that the graft was vital in its entire extent, but at the upper part there was a slight sequestrum and at the lower end where it was fixed by a metal band osteogenesis was not evident. At the end of one hundred and fifty days it was found that the graft had been broken in the center, but the fragments were well approximated. At the end of two hundred days a callus of considerable thickness surrounded the area of fracture but absorption at the site of the metal band was very marked.

At the end of two hundred and seventy days the fracture was well consolidated by a strong callus and at this point the graft had grown considerably in volume. An operation was then done to remove the metallic strip which appeared to hinder union, and the patient left the hospital. A year after the original operation the X-ray showed that the fibular graft had increased in diameter, but deep atrophy had caused a second fracture at the former site of the metallic band. Following union of this fracture the patient was again discharged from the hospital.

Three and one-half years after the original operation the tibia was practically normal and it was no longer possible to determine the line of demarcation between the two tibial stumps or any trace of the two fractures.

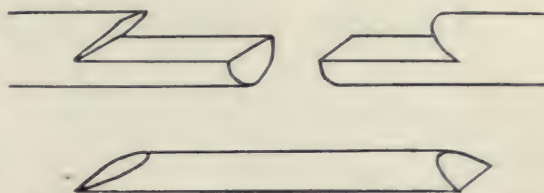
Moreau, J.: The "Swallow-Tail" Bone Graft (*La greffe osseuse "en queue d'aronde"*). *Arch. franco-belges de chir.*, 1921, xxv, 256.

In the method described by Moreau the graft is cut in the shape of a trapezoid, its two ends being bevelled off. The ends of the bone to receive the graft are then prepared in a reverse way so that the graft fits exactly. This method of fitting a trapezoidal piece in a mortise is known in carpentry as the "swallow-tail" or "dove-tail" method. The graft and bone ends are tied with a loop of chromic catgut.

Several clinical cases are described with roentgenograms. From these and from theoretical considerations the author draws the following conclusions:

1. Swallow-tail bone grafts are to be recommended because they penetrate and are encased by healthy bone tissue, and they are in contact with a large surface of the bone to which they are grafted.

2. The method of fixing such grafts in position prevents any interruption of contact with the fragments, renders the use of metallic fixation unnecessary, holds the fragments in their proper position, and prevents deformity when union takes place. The diaphyses are restored to their primary position.



Above, the trapezoid mortise. Below, the bevelled graft.

3. This method of bone grafting is indicated particularly in cases of pseudarthroses and loss of substance in the bones of the forearm.

W. A. BRENNAN.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Klapp, B.: The Present Status of Surgery of the Joints (*Ueberblick ueber den gegenwaertigen Stand der Gelenkchirurgie*). *Berl. klin. Wchnschr.*, 1922, lviii, 1317.

Klapp discusses in detail the antiseptics which have been used with good results during and since the war. He agrees with Bier that tuberculosis of the joints should be treated not only by surgery but also by heliotherapy or the induction of hyperæmia and injections of sodium iodide. It is now seldom necessary to amputate for tuberculosis of the joints.

Operative mobilization of stiff joints and plastic surgery of the joints are touched upon, including methods developed within the last few years by which excellent results have been achieved according to the reports of Wolff, Helfferich, Payr, Lexer, and others. The statement is made that arthritis deformans is a condition very well suited for operative mobilization.

In conclusion the author discusses fracture of the neck of the femur and its surgical treatment. In certain cases, when the disability is severe, it is necessary to extirpate the head in order to place the shaft in the acetabulum so that walking will be possible.

CREITE (Z).

Pascalis, G.: The Operative Treatment of Cases of Immobilization of the Elbow Due to Muscular Retraction (*Traitement sanglant de quelques cas d'immobilisation du coude par rétraction musculaire*). *Rev. de chir.*, Par., 1921, lix, 624.

The author describes an operative method consisting in elongation of the biceps to relieve immobilization of the elbow caused by muscular contraction due to a suppurated wound. It is generally taught that the biceps has a tendon inserted in the tuberosity of the radius and an aponeurotic expansion detached from the internal border of this tendon which becomes fused with the antebrachial aponeurosis. On close observation, however, conditions appear somewhat different. The aponeurotic expansion is not detached from the internal edge of the principal tendon but is a true accessory tendon

to which the superficial fibers of the muscular body are attached. This accessory tendon, immediately subjacent to the principal tendon, spreads out fan-wise and is attached to the superior crest of the ulna. It is well fused with the antebrachial aponeurosis but keeps its anatomical individuality. Evidently it is to this tendon that the muscle owes its power of supination.

The author's operation consists in sectioning the two tendons and suturing them end-to-end, thus obtaining correction of the faulty attitude of the arm. The tendons are isolated, the accessory tendon is sectioned at its lowest part, the principal tendon is sectioned at the point where it is united to the muscle, and the accessory tendon is slightly twisted on its axis and sutured at its distal extremity to the proximal extremity of the principal tendon. If necessary, an elongation of 5 or 6 cm. may be obtained.

W. A. BRENNAN.

Pieri, G.: Osteoplastic Amputation of the Femur by Dalla Vedova's Method and Its Complete Cinematization (L'amputazione osteoplastica del femore secondo Dalla Vedova e la sua cinematizzazione completa). *Chir. d. organi di movimento*, 1921, V, 535.

In Pieri's opinion the stump formed by the technique devised by Dalla Vedova in 1913 best fulfills the three conditions regarded by Codavilla as essential in an amputation stump of the lower limb and gives the best conditions for cinematization. Codavilla's conditions are: (1) firm adaptation to the prosthetic apparatus; (2) transmission of the weight of the body to the apparatus; (3) ability of the stump to perform in the apparatus the necessary movements.

The Dalla Vedova stump may be considered a partially cinematic stump because plastic motors are formed in the flexor-extensor loop and there is a free smooth cap or lid on the end of the femur which closes the surface of the bone section. The branches of the muscle loop have antagonistic movements, and if the surgeon succeeds in creating supporting points on the branches of this loop to transmit movement to prosthetic apparatus he will transform the operation into a true cinematic amputation.

The technique followed by Pieri in carrying out his method of stump formation comprises a curvilinear incision made on the anterior surface of the knee, beginning on the posterior margin of the condyle and descending to the anterior tuberosity of the tibia. The end of this incision is united on the posterior surface of the knee to a second incision having its convexity downward so that a reversed V with curved sides is formed. The anterior flap is made by dissecting the skin and subcutaneous tissue to the insertion of the patellar tendon which is cut at this point, and the aponeurosis and ligaments are cut along a line parallel to the cutaneous incision. The front flap is lifted up and the articulation of the knee is opened. In the disarticulation of the knee the crossed ligaments and the meniscus are left

attached to the tibial epiphysis. In the inferior epiphysis of the femur a saw cut is made on a frontal plane slightly oblique from below upward and from behind forward and an almost right-angled block of bone is removed, a thin cap of bone corresponding to the femoral trochlea and held only by a periosteal hinge being left. This bone shell is then drawn up and sutured to the femur.

The aponeurosis is cut along the posterior cutaneous incision and the tendons are sectioned 2 or 3 cm. under the line of the cutaneous incision. Following their exposure, the vessels are cut between ligatures and the nerves are cut as high as possible. The remaining soft parts uniting the leg and thigh are then severed.

The flexor tendons are sutured to the patellar tendon, the flexors being shortened and sutured under tension. The skin is sutured after the insertion of drains.

This osteoplastic operation was performed by Pieri on two soldiers who had had an amputation some distance below the knee. In a third case it was done for gangrene of the leg following an injury. In two other cases of amputation it was modified by the formation of a cutaneous tunnel and plastic muscle motors for cinematization. The end-results were satisfactory. The soft parts covering the bone stump were quite elastic. The cutaneous tunnels through which the prosthetic apparatus was attached in the cinematic procedure were formed in much the same way as in other cinematic stump operations.

W. A. BRENNAN.

Tavernier, L.: Operative Treatment of Ankylosis of the Knee Joint (Traitement opératoire des ankyloses du genou). *Rev. d'orthop.*, 1921, 3 s. viii, 577.

Operative interference in ankylosis of the knee attempts to obtain ankylosis in a better position or to re-establish movement in the joint.

Limitation of extension due to popliteal cicatrices or retraction of the flexor tendons is not true ankylosis.

When correction of position alone is desired and when the ankylosis is slight, osteotomy or osteoclasis are both of value, but when the flexion deformity exceeds 135 degrees the advantages of osteotomy are apparent. In flexion deformities of 90 degrees, trochlear resections, progressive reduction, and popliteal tenotomy constitute the best treatment.

To re-establish mobility in an ankylosed knee there are two procedures: arthroplasty and articular grafting. The principles of arthroplasty involve the breaking up of the ankylosis, the placing of the articular surfaces in a position as nearly normal as possible, and the interposition of tissue to maintain the mobility in the articulation. Pedicled flaps of muscle, aponeurosis, and subcutaneous fat, fascia lata, and amniotic membrane have all been interposed with varying success. Schepelmann believes that the separation of the articular surfaces by traction and early mobilization are of far greater value than the interposition of a flap.

Although complete hæmostasis is obtained ultimately if an Esmarch bandage is not used during the operation, the operative field is less clear. All of the numerous incisions recommended have the disadvantage that it is impossible to lengthen the quadriceps tendon, particularly in old ankyloses. Putti, however, has recommended an incision anterior to and below the patella and continued laterally by two incisions encircling the bone.

The author believes the resection of peri-articular fibrous tissue is a very important step in the operation. It is generally agreed that after the operation traction is indicated to separate the bony surfaces and prevent dangerous compression upon the interposed tissue. The time at which movement is begun and the amount of energy used in the movement are factors of great practical importance.

The author agrees with Murphy that the unsuccessful results of arthroplasty are due to the operative technique or poor postoperative treatment. The results of articular grafting are not brilliant and the indications for this treatment extremely limited.

The unfavorable conditions for arthroplasty are, in the order of their importance, bony ankylosis, involvement of the patella in the ankylosis, muscular atrophy, a tuberculous origin of the ankylosis, and

absence of the patella. The latter three conditions may be considered relative contra-indications.

LOYAL E. DAVIS, M.D.

Wotschack: The Cause of Spontaneous Rupture of the Quadriceps Muscle: Mobile Body of the Patella During Growth (Beitrag zur Entstehung der spontanen Quadricepsruptur: Corpus mobile der Patella in der Entwicklung). *Arch. f. klin. Chir.*, 1921, cxviii, 726.

Only seven cases of direct rupture of the quadriceps muscle are reported in the literature. The mechanism of the rupture is the same as that of tears of other muscles and tendons. Indirect causes include a fall on the patella, muscular contraction made in falling, and disease of the muscle. Fairly large bony and cartilaginous bodies indicating a dissecting process in the bone have been found relatively frequently in the torn-off quadriceps tendon.

Wotschack reports a case in which the disease process is seen in an early stage, that is, the bony piece is not yet entirely separated and consequently is not torn out with the tendon. A lateral view in the roentgen picture shows the piece, 1 cm. wide and 1 cm. high, separated above by a fissure from the rest of the bony tissue but below joined directly to the bone. From this finding the danger of rupture of the quadriceps muscle appears imminent. PLENZ (Z).

SURGERY OF THE SPINAL COLUMN AND CORD

Sauerbruch, F.: The Surgical Treatment of Severe Scolioses (Ueberlegungen zur operativen Behandlung schwerer Skoliosen). *Arch. d. klin. Chir.*, 1921, cxviii, 550.

In fibroid phthisis there is always a deflection of the spinal column toward the normal side. Following paravertebral resection of the ribs, the spinal column bends slowly back, its vertex coming back close to the median line. In many cases an over-correction is reached. Drawing together of the ribs and relaxation of their tension determine the shape of the spinal column.

Sauerbruch and Lange together operated on a patient with a high-grade fixed scoliosis. All the ribs on the concave side were to be resected near the vertebræ. In order not to place too great a strain upon the patient, only the three lower ribs were resected in the first stage of the operation. These are the most difficult to resect because from the ninth rib downward the vertebral segments disappear under the dorsal musculature. After the wound was completely healed gymnastics were begun. The condition improved during the first few days but later remained stationary.

Three months later, at a second operation, the first seven ribs were resected (4 to 5 cm. from each, as at the first operation). No improvement could be determined as a direct result of the second operation, either in the habitual posture or in mobility. After healing of the wound gymnastic treatment was again given. Gradually the body

was drawn over more from the right convex side to the left concave side and the patient became able, with an effort, to assume an erect position.

To reproduce the enormous effect of the approximation of the ribs on the concave side, Sauerbruch's assistant, Frey, proposed a sort of gathering up of the ribs on the convex side. In animal experiments it was found that this operation had very good results, particularly when the ribs on the concave side had been resected previously. Sauerbruch used this method in the case of an 18-year-old girl. He first resected all the ribs on the concave side and then drew the third to the seventh ribs on the convex side very tightly together by means of copper wire. The result was so surprising that at the time the dressings were first changed the spine might have been called straight. Unfortunately, however, the wires cut through the ribs and one was expelled as a foreign body.

Acting on a second proposal of Frey, Sauerbruch operated on a 17-year-old boy with severe, rachitic, fixed, right-sided dorsal scoliosis. The operation was performed in two stages. In the first stage a section 3 cm. long was resected from the second to the ninth ribs on the concave side, and in the second stage a similar resection was done on the second to the eighth ribs on the convex side. The effect on the heart and lung action was remarkably slight. A plaster of Paris dressing was applied in extension with slight pressure on the scoliotic convexity of the chest. Eight days after the removal

of the plaster of Paris the scoliotic convexity of the chest had nearly disappeared and the scoliotic curvature of the spine had become considerably flatter.

PORT (Z).

Costantini and Duboucher: A Case of Anterolateral Luxation of the Vertebral Column Reduced by Open Operation (A propos d'un cas de luxation antéro latérale de la colonne vertébrale réduite par la methode sanglante). *Rev. d'orthop.*, 1922, xxix, 27.

The authors' case was that of a man aged 45 years who was run over by an automobile. The X-ray showed: (1) right anterolateral luxation of the second dorsal vertebra on the third; (2) overriding of the lower articular processes of the second lumbar vertebra on the pedicle of the third; (3) downward displacement of the right part of the body of the third lumbar vertebra which was more marked in its anterior portion; (4) fracture of the transverse processes of the second and third lumbar vertebrae on the left side, opposite the lateral luxation of the body of the second lumbar vertebra.

The authors attempted to determine the mechanism of these injuries by studies on cadavers and skeletons but they were unable to arrive at any entirely satisfactory conclusion. They are inclined to the belief, however, that torsion combined with lateral flexion was an important factor.

The luxation was easily reduced by operation after suspension and traction had failed.

W. A. BRENNAN.

Kleinberg: Fractures of the Spine. *J. Bone & Joint Surg.*, 1922, iv, 80.

In a great many cases of fracture of the spine with a definite history, the presence of deformity, and localized pain, the diagnosis is quite easy. In fresh cases, however, the early recognition of the true condition is often difficult, especially in industrial injuries.

Following direct or indirect violence causing vertebral fracture there is localized and persistent pain which varies in degree. This may be so mild that the patient overlooks it or so severe that morphine is necessary for its relief. There may also be weakness out of proportion to the other findings. Both pain and weakness are increased with motion. The pain may be referred also to the nerve distribution corresponding to the level of the lesion: for example, to the lower abdomen when the lesion is in the lower dorsal spine and to the lower limbs when the lesion is in the lumbar region. Paralysis of the legs and loss of sphincter control and sensation, indicating cord injury, are suggestive of spinal fracture and occur in about two-thirds of all cases.

Objectively there is tenderness, mild or marked, which is always definitely localized. Limitation of motion in all directions is found and helps to differentiate between fracture and sprain, the limitation in the latter case being in only one or two directions. Change in contour such as kyphosis

or lordosis is an important sign but not always present. Roentgenograms taken in two planes furnish the most convincing evidence of fracture. Lateral views are best since in these the vertebral bodies are not obscured by the spinous and transverse processes, the laminae, and pedicles. While the patient is lying on his side the intestines should be pushed toward the front of the abdominal wall (into the flank).

The prognosis as to life may be said to be good if intercurrent affections are not considered. Death may result indirectly from gradual exhaustion due to paralysis and trophic lesions. The repair of the fracture itself is slow, the callus formation being much less around a fractured vertebra than that appearing in fractures of other bones. The period of disability is at least two years and the patient is never able to do lifting or other heavy work.

The treatment must include early and efficient support of the back. When the patient is able to walk, such support is obtained by means of a brace or cast or by internal bone splinting. Bone splinting shortens the period of disability and for this reason should be done early if at all. Its one disadvantage seems to be the amount of ultimate stiffening it produces. The usual fracture of one vertebra produces stiffening of only one or two joints, while a bone graft for internal splinting must extend over at least six vertebrae. This disadvantage is minimal in the dorsal region where normally very little flexion is required. When the radical operative method of treatment is used the period of disability may be only from six to nine months.

The author states that in cases with symptoms of cord injury it is difficult to advise laminectomy without waiting a few days to observe the effects of rest and efficient support. From the symptoms alone it is impossible to tell the pathology of the lesion. The roentgenogram is not an index of the degree of the cord injury since in some cases with severe crushing fractures and displacement of fragments there are no cord symptoms. If laminectomy is definitely indicated a delay of several days may allow further damage to the cord. On the other hand, expectancy may be rewarded by the spontaneous disappearance of the paralysis if the spine is given proper support. Many surgeons believe that the only safe procedure is laminectomy performed as early as the patient's general condition will allow it. The relief which follows the operation may not be the result of the decompression but due to spontaneous recovery, especially if it comes late. The very high mortality rate of this operation must be kept in mind.

Eight cases are reported which were seen by the author from one to many months after the injury. They were all ambulatory cases without cord symptoms except a spastic gait in one and reflex gastric symptoms in another. Most of them were relieved of the pain and disability by the application of a plaster jacket. One patient with fracture of the fifth lumbar vertebra was not relieved after six

weeks of such support but was practically well eight weeks after the insertion of a bone graft.

WILLIAM A. CLARK, M.D.

Hartshorn, W. E.: Fracture and Dislocation of the Cervical Vertebrae without Paralysis; Report of a Case. *Boston M. & S. J.*, 1922, clxxvii, 141.

In reporting a case of fracture and dislocation of cervical vertebrae without paralysis the author classifies some of the more common injuries and describes their symptoms. Broadly speaking, they are of two main types, those with and those without paralysis.

Injuries to the spinal cord may be classed as follows:

1. Concussion. This may be associated with a temporary paralysis.

2. Trauma with intraneural or spinal hemorrhages. The paralysis may persist for a considerable period in certain groups of muscles, and then gradually disappear.

3. Injuries to the cord from fragments of the bony framework, with resulting pressure symptoms or laceration of the cord with destruction of tissue.

4. Pressure on the cord due to dislocation of the vertebrae without fracture.

5. Fracture and dislocation of the vertebrae without injury to the cord.

6. Compression fractures of the bodies of the vertebrae.

JOHN DUNLOP, M.D.

Albanese, A.: Clinical and Anatomical Research on Bertolotti's Syndrome (Per la conoscenza della sindrome del Bertolotti. Ricerche cliniche ed anatomiche). *Chir. d. organi di movimento*, 1921, v, 557.

Bertolotti's syndrome is the characteristic clinical syndrome due to sacralization of the fifth lumbar vertebra. In 1917 Bertolotti called attention to the congenital anomalies of the vertebral column, especially those of the sacrolumbar region, and to the nervous and vascular syndrome caused by them. He demonstrated by means of the X-ray that many obscure clinical conditions incorrectly considered to be sciatica or lumbago were due to an abnormal development of the lateral processes of the fifth lumbar vertebra and to the abnormal relations of this vertebra to the sacral and iliac bones. Albanese describes a series of cases of such anomalies, in some of which the syndrome appeared after the twentieth year of age and in others of which the lumbar sacralization was not the only deformity present.

Unilateral sacralization is not always accompanied by scoliosis or by unilateral symptoms. Hypertrichosis is not a constant finding. In only one case could pregnancy be regarded as the cause of the symptoms.

The author suggests that the anomaly may be a phenomenon of atavistic reversion.

W. A. BRENNAN.

Sicard, J. A., and Forestier, J.: Chronic Lumbar Rachialgia — Chronic Rheumatismal Lumbago; Laminectomy (Rachialgie lombaire chronique—lumbago chronique rhumatismal: laminectomie). *Presse méd.*, Par., 1922, xxx, 45.

In the type of chronic rheumatismal lumbago discussed the essential characteristic is the absence of any indication of a bone lesion in the roentgenogram. The condition is a rachialgia, lumbago, or spondylalgia rather than a lumbar arthritis or spondylitis. The treatment should therefore be surgical rather than medical or physical, viz., a lumbar laminectomy, which is curative and not dangerous.

The authors give the positive and negative characteristics which differentiate chronic lumbar rachialgia from other chronic spinal conditions of the rheumatismal type. Among the positive characters are: (1) stiffness localized in the lumbar spine; (2) pain which tends to be chronic, is noted especially when the patient changes from the sitting to the standing position, and radiates about the fifth lumbar vertebra and bilaterally toward the sciatic region; (3) muscular contraction, a lumbar rigidity probably due to some peri-articular ligamentous sclerosis and evidently an antalgic attitude; and (4) chronicity.

Among the important negative characters are the absence of: (1) any vertebral lesion discernible by the X-ray, (2) changes in the cerebrospinal fluid, (3) psoas pain in extension movements of the thigh, and (4) reflex and sensory phenomena.

The bilateral lumbar laminectomy recommended includes the posterior segments of three, four, or five vertebrae. The solidity of the spinal column is never compromised by it. The authors have already reported cases in which repeated laminectomies done on the same patient in the dorsolumbar region with only two or three intervening vertebrae did not affect the solidity of the column. Laminectomy appears to be the treatment of choice in cases of lumbago and even in chronic cases of lumbar arthritis with osteophytes. The operation is beneficial and is not followed by either local or general complications.

In the course of the laminectomy for these conditions the epidural space will be seen to be grooved, i.e., there are projecting segments due to hypertrophy of the adipose tissue alternating with depressed segments corresponding to the yellow ligaments, a veritable transverse bridge being formed from one yellow ligament to the other.

Four clinical cases treated by lumbar laminectomy are reported in detail.

W. A. BRENNAN.

SURGERY OF THE NERVOUS SYSTEM

Gatch, W. D., and Ritchey, J. O.: Neurofibromyoma Treated by Conservative Operation. *Ann. Surg.*, 1922, lxxv, 181.

Two cases of neurofibromyoma treated by conservative operation are reported as follows:

CASE 1. A tumor, 2 cm. in diameter, which was painful and increasing in size, was removed from the nerve trunks of the brachial plexus. On microscopic examination the cell mass was found to be essentially fibrous and myxomatous tissue, but an occasional area in the frozen sections suggested sarcoma. No nerve tissue at all was found. The clinical course of the case ruled out malignancy. From the clinical course and pathologic examination the tumor was classed as a false neuroroma of the class neurofibromyoma, fibrous tissue predominating.

CASE 2. A tumor which increased from the size of a hen's egg to that of a goose egg in two months was situated on the brachial plexus. This growth had been present for ten to twelve years and caused pain and tingling in the arm. Microscopic examination following its removal showed it to be a neurofibromyoma in which the myxomatous tissue predominated.

Guides to the surgeon as to the malignancy of nerve tumors are:

1. Their duration.
2. Motor or sensory paralysis. An infiltrating tumor produces either or both.
3. Their gross appearance; (a) cystic or jelly-like, (b) encapsulation.
4. Microscopic study.

GEORGE E. SUTTON, M.D.

Gosset, A., and Charrier, J.: The End-Results of Nerve Grafting in the Surgery of Nerve Wounds (Résultats éloignés fournis par la greffe nerveuse dans la chirurgie des plaies des nerfs). *J. de chir.*, 1922, xix, 1.

The Great War revived an interest in the use of grafts to bridge nerve lesions with a large loss of substance, a subject first considered by Albert in 1876. Whenever possible, however, direct end-to-end suture of the ends of a divided nerve is preferable to any other method.

The author reports the end-results of nerve grafting operations performed by himself and other French surgeons. Autografts, homografts, and heterografts were used. The results are classed as good if sensory and motor regeneration has occurred; as mediocre, if there are only signs of sensory return with slight motor or electrical reaction; and as poor if there is no evidence of regeneration.

Of the autograft operations performed by the author 35 per cent gave good results; 45 per cent, mediocre results; and 20 per cent, poor results. Of two heterograft operations both were failures. Of thirty-one autograft operations performed by other French surgeons 30 per cent gave good results; 40 per cent, mediocre results; and 30 per cent, poor results. Of ten operations in which homografts were used, two were successful, three gave mediocre results, and five were failures. Of fifty-eight heterografts, five were successful, forty gave mediocre results, and thirteen were failures. The results obtained by direct end-to-end suture are therefore better than those obtained by nerve grafting. Of the artificial methods of bridging nerve defects autografting is best.

LOYAL E. DAVIS, M.D.

MISCELLANEOUS

CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

Ansaldi, C.: A Lymphatic Cyst Developing in an Accessory Adrenal Gland (Ciste linfatica sviluppata in una ghiandola surrenale accessoria). *Polid.*, Rome, 1922, xxix, sec. chir., 65.

Ansaldi's patient was a man 44 years of age who presented a voluminous tumefaction bounded internally by the median line, below by the bi-iliac line, above by the costal arch, and externally by the prolongation of the mid-axillary line. The tumor was smooth, elastic, slightly movable, and not painful on palpation. Following colonic insufflation and exploratory puncture a diagnosis of retroperitoneal cyst was made. Insufflation showed that the colon was in front of the tumor and that the latter was situated below the right kidney.

Laparotomy confirmed the diagnosis. The colon was intimately adherent to the cyst. During the

enucleation of the cyst it ruptured, flooding the peritoneal cavity with its contents. The patient made an excellent recovery.

In its retracted condition following its removal the cyst measured 12 cm. in length and 11 cm. in breadth. Its internal surface was covered with nodules and plaques. Histologically the inner surface showed neither epithelial nor endothelial lining, but appeared to be formed by the fascicular layer of the cortex of the adrenal. Staining showed that all the elements were infiltrated with fat granules.

The author discusses retroperitoneal cysts in general: The cyst in the case reported he regards as a lymphatic cyst developing in an accessory adrenal gland. These cysts were originally described by Niosi who reported a case. They have no special clinical characteristics. They begin and evolve slowly and usually attain a considerable size before the patient seeks medical advice. Later they cause edema of the lower limbs and may affect

the ureters and bladder. They are difficult to diagnose, especially when they are large. In the author's case the general diagnosis of retroperitoneal cyst was made because of the cystic consistency of the tumor and the fact that the colon lay in front of it. The possibility of a renal tumor was excluded because there were no urinary symptoms and the tumor was fixed. Renal tumors are relatively mobile.

The precise nature of the cyst could be established only by histologic examination.

W. A. BRENNAN.

Knox, L. C.: The Relationship of Massage to Metastasis in Malignant Tumors. *Ann. Surg.*, 1922, lxxv, 129.

It has been generally assumed, without direct experimental proof, that a number of factors favoring the production of metastasis in malignant tumors in man are purely physical. These include the size and connective-tissue relations of the tumor cells, the pulsating or contractile movements of the organs in which they are implanted, the number of the blood vessels and the thickness of the blood-vessel walls upon which susceptibility to trauma by pressure or massage depends. On the other hand, accurate clinical study and experimental work have discredited the occult and convenient theories of tissue predispositions and specific immunity of organs for until it is shown that simple mechanical and biological facts do not account for the peculiarities in the occurrence and distribution of metastases vague theories should not be substituted.

In animals, very gentle massage for a total period of from two to five minutes, distributed over a number of days, has been shown to set free numerous particles of tumor which form emboli in the lungs. The formation of metastatic tumors by such emboli depends upon the growth activity of the primary growth. Tumors which do not grow readily when implanted in the subcutaneous connective tissue form much fewer metastases than those of higher virulence. Carcinomata and sarcomata of the compact spindle-cell variety are not influenced. Therefore the importance of avoiding diagnostic or operative manipulation of a tumor in man is obvious.

C. CORBIN YANCEY, M.D.

Schaaning, G.: Implantation Metastases (Implantationsmetastaser). *Norsk Mag. f. Lægevidensk.*, 1921, lxxxii, 109.

CASE 1. A 35-year-old woman was operated on for carcinoma of the cervix. During healing, a tissue resembling granulation tissue with extensive ulceration developed in the abdominal wound. Under the microscope this tissue appeared similar to cancer of the uterus.

CASE 2. A 50-year-old woman was operated on for carcinoma of the fundus of the uterus. Between three and four months later carcinoma nodules developed in the abdominal scar.

CASE 3. The patient was a 55-year-old man with cancer of the stomach. A year and a half following resection the operative scar showed infiltration which under the microscope had the appearance of gastric cancer.

CASE 4. A 53-year-old woman with cancer of the stomach was treated by resection. Six months later ulcerating nodules appeared in the abdominal scar. Microscopic examination showed carcinoma.

CASE 5. The patient was a woman 57 years of age who had been operated on three years previously for hypernephroma. During the last six months there had developed in the operative scar a well-defined tumor which microscopically showed the structure of a hypernephroma.

In all these cases the incisions were made in normal tissue so that the tumor mass would not come into direct contact with the wound. Therefore the secondary growths must have been due to superficial, detached cells and these must possess considerable vitality. Case 5 is of particular interest because two and a half years passed before the secondary tumor became noticeable.

KORTIZINSKY (Z).

SERA, VACCINES, AND FERMENTS

Stewart, T. M.: Autotherapy. *N. York M. J.*, 1922, cxv, 135.

The author gives his technique and results in the use of autotherapy. Autotherapy consists in the subcutaneous or intravenous injection of toxic substances obtained from sputum or aural or nasal discharges prepared with distilled water and incubated at room temperature. Blood and serum are also used.

Waag, Carnot, and Pappenheim report good results in pernicious anemia from subcutaneous injections of the patient's own blood. Strossberg obtained good results in pellagra with autoserum. The author cites cures of ethmoiditis and laryngitis effected by subcutaneous injections of nasopharyngeal discharges highly diluted with normal saline to prevent anaphylaxis.

Viton and Poncet give high dilutions of the patient's own blood intravenously in a great variety of cases. In the same class of cases they use also minute doses of tuberculin with good results.

The principle of the treatment is the action of unknown immune bodies. CAROL E. JAMESON, M.D.

BLOOD

Buchanan, J. A.: The Medicolegal Application of Blood Group. *J. Am. M. Ass.*, 1922, lxxviii, 89.

The author's investigations have proved that the blood group is not a criterion in the identification or fixing of parentage.

One of the most fundamental features of Mendel's experiments was the demonstration of the heterozygous nature of plants. A heterozygote presents objectively a particular character, but through its

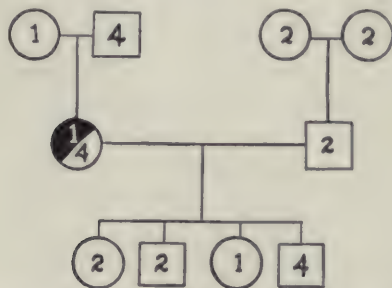
germ plasm has the capacity of transmitting the character which was evident in a previous generation. The heterozygous type occurs in man and corresponds genetically with the hybrid of Mendel. In man the heterozygote cannot be determined until the offspring is studied. The homozygous and heterozygous natures of man are clearly demonstrated when both parents and at least three of the offspring are studied.

It is a definitely established fact that a character once dominant is always dominant. The intermediate or hybrid stage does not appear objectively in man, as the crossing of two inheritable but different characters results in the appearance in the immediate offspring of the segregation of the characters concerned and thereby necessitates the use of substitutes for the words "dominant" and "recessive" in connection with human heredity. To describe the hereditary characters of man the expressions "dominant" and "evident" are more exact.

An indispensable factor in proving the Mendelian segregation of characters is a knowledge of the characters involved in the matings.

It has been supposed that blood groups not represented in either parent have been produced by a union of the hypothetical agglutinins and agglutinogens. A review of the family pedigrees for blood groups, however, shows distinctly that the groups in the children are limited only by the groups represented in their ancestors. Blood groups occur in either a homozygous or a heterozygous state; if the former, the children are all of the same group as the parents, and if the latter, the groups present in the grandparents will appear.

The danger in the medicolegal application of the idea that the blood group of the child must be evident in the parents is clearly shown in the accompanying figure. If during the course of divorce proceedings or a will contest in the family represented by this figure the blood group had been used as a criterion of legitimacy, the daughter in Group 1 would have been held illegitimate. Moreover, a grandparent might be a heterozygote and in virtue of this might transmit a character to a son or daughter who in turn might be a heterozygote.



Demonstrating possibility that Group I may appear as the dormant character, and the possibilities for the miscarriage of justice if the blood group were used as a criterion of parentage.

Thus, the long concealed character might not appear for two or three generations.

The author concludes that it is to be hoped no court will ever utilize a means of adjusting a dispute that is surrounded by such possibilities for the miscarriage of justice.

Walterhoefer and Schramm: A New Method for the Surgical Treatment of Pernicious Anæmia (Ueber einen neuen Weg zur operativen Behandlung der perniziösen Anæmie). *Arch. f. klin. Chir.*, 1921, cxviii, 794.

In view of the desperate condition of persons suffering from pernicious anæmia, the authors regard as justifiable an attempt to stimulate the development of normal bone marrow by the removal of a portion of the degenerated marrow from a medullated bone. They expected a vicarious appearance of erythropoiesis of the spleen, as is observed in cases of destruction of the bone marrow by tumors, and hoped through the bone marrow to influence the function of the spleen, the failure of which brings about the same result as that caused by splenectomy.

The reports of nine cases are given following a description of the technique. The operation was undertaken only on patients who were severely ill. In one case death occurred on the second day, in another the condition was complicated by decubitus, and in a third the condition became worse. In the remaining six there was a very marked improvement in the general condition.

The cause of the subjective improvement is to be seen in an increase in the number of erythrocytes which set in soon after the operation. The hæmoglobin rose more slowly. No leucocytosis worth mentioning was observed in any case.

A conclusive statement as to the duration of the effect exerted on pernicious anæmia by the removal of marrow from a medullated bone is as yet unwarranted. Favorable effects were obtained in a series of cases.

NAEGELI (Z).

BLOOD AND LYMPH VESSELS

Montpellier, J., and Lacroix, A.: A Curative Fibrosis of Varices Obtained by Local Injections of Biniodide of Mercury (Fibrose curative des varices obtenue par injections locales de bi-iodure de mercure). *Bruxelles méd.*, 1922, xii, 168.

Sicard's method of treating varices seems to be a decided advance in therapeutics, but while the injection of sodium carbonate is not difficult for those accustomed to making intravenous injections, in the hands of those without much experience there is danger that the surrounding tissues may be injured by the powerfully caustic action of the sodium carbonate.

The authors have therefore sought a less irritating chemical possessing the obliterating qualities of sodium carbonate. This they found in biniodide of

mercury in aqueous solutions of 1 or 2 per cent such as are commonly employed in syphilis. An elastic band is placed below the varicose packets and the vein punctured with the needle of a syringe carrying 2 c. m. of the biniodide solution. No inconvenience is caused by the spreading of a quantity of this solution in the paravenous tissues.

The effects of such biniodide injections are in every way comparable to those of Sicard's solution. Twenty-four hours after the injection small varices are transformed into hard cords with apparently no circulation. In very large varices the effect may not be observed for four days or perhaps longer. The venous territory in the neighborhood of the point of injection tumefies and hardens. There is neither pain nor reaction. Histologic examination of tissue removed by biopsy shows rapid obliteration of the vein and total fibrosis.

W. A. BRENNAN.

GENERAL BACTERIAL INFECTIONS

Phemister, D. B.: *Hæmatogenous Staphylococcus Infections Secondary to Foci in the Skin.* *J. Am. M. Ass.*, 1922, lxxviii, 480.

The chief habitat of staphylococci is the skin. In most skin infections these organisms are found to be either the exciting cause or secondary invaders. The most important of such skin lesions are boils and carbuncles.

That skin foci are sources of hæmatogenous staphylococcus lesions is demonstrated by nineteen cases briefly summarized and grouped according to the structures involved. In all instances the staphylococcus, usually the aureus type, was the only organism in cultures from the pus obtained at operation. The only definite focus of infection for the entrance of the organism was in the skin, and in only one case was there a history of a recent focus in another region.

There were eight cases of osteomyelitis, involving such bones as the vertebrae, the tibia, femur, phalanges, ilium, radius, and humerus. In three cases two bones were involved; in two cases there were multiple renal abscesses; in three, a perinephritic abscess was found; in four, there was myositis, and in two, arthritis.

Lesions may occur in other structures such as the bursa, tendon sheaths, pleura, the pericardium, and endocardium.

Undoubtedly the nasopharynx is an important portal of entry for the staphylococcus, but as yet little is known regarding the exact site and duration of the lesions from which the organisms gain entrance.

CARL R. STEINKE, M.D.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Robertson, O. H., and Peyton, R.: *Sources of the Antibodies Developing After Repeated Transfusion.* *J. Exper. M.*, 1922, xxxv, 141.

There are several reasons for the gradual decrease in beneficial effect and the occasional injury due to

the frequently repeated injection of alien blood. The blood is destroyed more rapidly after repeated transfusions in normal animals than at first. Recent observations indicate that circulating antibodies, hæmagglutinins, and hæmolysins are involved in this destruction to a considerable degree.

The hæmagglutination in its most marked form has been traced to iso-antibodies, and the frequently associated rapid blood destruction is doubtless of similar origin. The antigenic relationship between the red cells of different rabbits is so close that normal iso-agglutinins become fixed upon their elaborator's own corpuscles.

As has been claimed by Klein, agglutinins are present within the red cells of rabbits and are readily demonstrated in watery extracts of the dried corpuscles. Whether similar agglutinins are ever present in human cells remains to be determined.

MORRIS H. KAHN, M.D.

Pawlenko, W. A.: *The Surgical Anatomy of the Splanchnic Nerve* (*Die chirurgische Anatomie des N. splanchnicus*). *Verhandl. d. russ. chir. Pirogoff-Ges.*, Petrograd, 1921.

In the author's opinion the induction of anæsthesia of the splanchnic nerve by Braun's method is of great importance. To explain it he undertook an anatomical investigation. The formation and the position of the splanchnic nerves were studied from the standpoint of their relationship to age, sex, and the form and size of the inferior thoracic aperture. The celiac plexus was also investigated, and the most accessible portion of the splanchnic nerve for the injection of an anæsthetic was determined. Pawlenko believes that an isolated anæsthesia of the individual organs of the abdominal cavity is possible.

There are three kinds of fibers in the splanchnic nerves: (1) vasomotor fibers, for the vessels of the intestinal tract; (2) motor fibers, for the muscles of the intestine, and (3) sensory fibers. There are three splanchnic nerves: the major, the minor, and the minimus. The major splanchnic nerve begins at a level between the fifth and the ninth ribs and has from one to five roots which usually originate in the sympathetic ganglia but sometimes begin at the interganglionic roots. The minor splanchnic nerve is formed at the level of the tenth to the twelfth rib and has one or two roots. It usually is joined with the major splanchnic nerve, but sometimes runs separately to the renal plexus, sending only a small branch to the major splanchnic nerve. The minimus splanchnic nerve, which is rarely found, is a small branch which begins at the last sympathetic ganglion and runs to the renal plexus.

In the thorax the splanchnic nerves are covered by the costal pleura and may shine through it. Running downward, they disappear between the median and lateral crura of the diaphragm into the abdominal cavity where, dividing, they run into the celiac plexus and semilunar ganglion. In the abdominal cavity the splanchnic nerves are covered by the parietal peritoneum.

The number of splanchnic nerve roots, the level of origin of the splanchnic nerves, and the angle of division of the individual roots show considerable variation. A comparison of the nerves of the left and right sides does not always reveal symmetry: the left splanchnic nerve usually begins higher than the right. The number of nerve roots is greater in the embryo than in the adult, and in the young their angle of division approaches a right angle whereas in adults the angle is acute. Sexual differences could not be demonstrated. The right splanchnic nerve ends in the celiac plexus at a lower level than the left.

Isolated infiltration of the splanchnic nerve is almost never possible; the injected fluid is always found in the region of the sympathetic nerve. When the injection is made high (at the level of the twelfth thoracic vertebra), the fluid may also infiltrate the right vagus nerve. For infiltration of the splanchnic nerve the injection must be made at the level of the twelfth thoracic vertebra, no deeper than $1\frac{1}{2}$ cm., and at an angle of 45 degrees to the anterior surface of the vertebra. The needle must be inserted into the right median crus of the diaphragm between the aortic hiatus and the oesophageal hiatus and directed upward and backward.

Isolated anaesthesia of the upper abdominal viscera can be obtained by injecting into the celiac and the superior mesenteric plexus. As the sensory fibers in the celiac plexus extend up to the level of the second lumbar vertebra through the rami communicantes, it seems necessary to anaesthetize the celiac plexus in addition to the splanchnic nerves. This can be done easily under direct vision.

WALCKER (Z).

Mayeda, T.: Investigations on Parabiosis, with Particular Consideration of Transplantation and Hypernephrectomy (Untersuchungen ueber Parabiose mit besonderer Beruecksichtigung der Transplantation und Hypernephrektomie). *Deutsche Ztschr. f. Chir.*, 1921, clxvii, 295.

Mayeda did the Sauerbruch-Heyde cœlio-anastomosis on each of two young white rats. Mice and guinea-pigs proved failures. Of seventy-five pairs of rats, twenty remained alive more than five weeks. The two partners were obtained from the same litters in eleven instances, from different litters in four, and from unknown litters in five. One of the pair frequently showed normal or increased growth, while the other was stunted and died first. Such parabioses the author calls "heterogeneous." In "homogeneous" parabiosis both of the partners develop equally well. These are the basic and constant types of parabiosis.

Mayeda claims that the animal of the heterogeneous parabiosis which dies first does not heal together with its partner but becomes separated from it by leucocytes and a wall of granulation tissue and shows changes like those of pernicious anaemia in the bone marrow and spleen; its blood is hemolyzed by the serum of the other animal.

The author agrees with Schoene that the parabiosis is a reciprocal homoioplastic; the transplantation is successful (homogeneous parabiosis) or unsuccessful (heterogeneous parabiosis).

Microscopic examination of the border layer and experiments with the injection of dyes during life and after death were made in cases of well and poorly healed parabioses. Dermal autoplastics in individual rats were almost always successful if the animals were no older than three months. After that age they were difficult. Freely transplanted pieces of skin were viable in 44 per cent of the non-parabiotic rats from the same litter and in 28 per cent of those from different litters. If the transplant took, the subsequent parabiosis of the animals was usually successful.

Pedicled flaps were exchanged between ten pairs of non-parabiotic rats and were sectioned after seven to fourteen days. In five animals the transplants remained intact for longer than a month and were covered with hair.

The results of the autoplastics on animals living in parabiosis became very poor. Free dermal homoioplasty was never successful. In the separation of the parabioses, a few millimeters of bordering tissues were also removed. These degenerated in animals which showed a developmental difference among themselves, and healed in parabiotic animals of equal development.

The adrenals were transplanted between seven pairs of parabiotic rats. After nineteen days one-quarter of the adrenal cortex transplanted into the kidney was found in one instance. Bone homoioplasty failed in parabiosis. The bilateral extirpation of both adrenals of one partner was well borne by ten well-developing pairs of parabiotics, but pairs showing unequal development rarely survived, whether the two adrenals were taken from the stronger or the weaker partner. From the surviving well-developing pairs, the partner with the adrenals could later be bilaterally hypernephrectomized without harm. In the meantime the accessory adrenal tissue had developed in the animal operated upon first. Upon this factor depends the survival of one of the rats hypernephrectomized bilaterally while in parabiosis after its subsequent release from the parabiosis. In this way a procedure was developed for inducing further growth of the accessory adrenals.

A bibliography of sixty-one titles and nine microscopic pictures are appended. SCHMIDT (Z).

ROENTGENOLOGY AND RADIUM THERAPY

Warren, S. L., and Whipple, G. H.: Roentgen-Ray Intoxication. I. Unit Dose Over Thorax Negative, Over Abdomen Lethal. Epithelium of Small Intestine Sensitive to X-Rays. *J. Exper. M.*, 1922, xxxv, 187.

The authors conducted a series of experiments upon normal dogs for the purpose of investigating the systemic intoxication which develops after a

suitable exposure to large doses of hard roentgen rays. Full details of the methods followed are given, together with the results obtained from clinical observations and autopsy findings. The findings are summarized in the following conclusions:

Roentgen radiation of the thorax of the dog (abdomen shielded) gives no clinical evidence of intoxication even when large doses (up to 512 ma.-min. are used). There may be a transient leucopenia and a slight rise in urinary nitrogen.

Roentgen radiation of the abdomen of the dog (thorax shielded) with a dose of 350 ma.-min. will almost certainly cause a fatal intoxication. Smaller doses may be survived but usually cause signs of gastro-intestinal intoxication.

The lethal intoxication due to abdominal radiation presents a remarkably uniform clinical and anatomical picture. There is a latent period of twenty-four to thirty-six hours during which the dog is perfectly normal clinically. The second day usually shows the beginning of diarrhoea and perhaps of vomiting. The third and fourth days show progressive intoxication with increasing vomiting and bloody diarrhoea until the dog becomes stuporous. Death almost always occurs on the fourth day.

Anatomically the only important lesions are to be found in the small intestine. The epithelium of the crypts and villi shows more or less complete necrosis, and this condition may involve almost all of the small intestine. The epithelium may vanish completely except for a few cells here and there which have escaped and are often found in mitosis, probably an effort at repair and regeneration.

The authors are forced to the conclusion that this remarkable injury of the epithelium of the small intestine is responsible for the various abnormal reactions and final lethal intoxication which follow a unit dose of roentgen radiation over the abdomen of a normal dog. The sensitiveness of the intestinal epithelium to the roentgen rays is not appreciated and should be given proper consideration in clinical work.

ADOLPH HARTUNG, M.D.

Warren, S. L., and Whipple, G. H.: Roentgen-Ray Intoxication. II. A Study of the Sequence of Clinical, Anatomical, and Histological Changes Following a Unit Dose of X-Rays. *J. Exper. M.*, 1922, xxxv, 203.

The experimental data of this article supplement those of a previous article on the same subject. All of the experiments previously performed made it very clear that initial injury of the epithelium of the small intestine was responsible for the severe clinical reaction and lethal intoxication. It seemed desirable to study this reaction carefully and to record the histologic and gross changes which day by day followed the initial exposure. Therefore a number of dogs were given lethal doses of roentgen rays over the abdomen, and autopsied at varying intervals thereafter. The results are recorded in the following summary:

Roentgen radiation in lethal dosage given over the abdomen of a normal dog is followed by a physiological reaction of remarkable uniformity.

The first twenty-four-hour period following the exposure is negative clinically and anatomically, but histologically there are distinct changes in the bone marrow, spleen, lymph glands, and ovaries, and definite nuclear changes with degeneration in the crypt epithelium of the small intestine.

The second twenty-four-hour period shows slight clinical disturbances of gastro-intestinal nature (vomiting and diarrhoea). The mucosa of the small intestine shows scattered ecchymoses. The necrosis of the crypt epithelium may be almost complete, while the epithelium of the villi remains practically intact. Slight oedema and invasion of wandering cells are noted.

The third twenty-four-hour period shows increasing clinical disturbance with vomiting and bloody diarrhoea. The small intestine from the edge of the pylorus to the rim of the ileocaecal valve is raw, red, and inflamed. The crypt and villous epithelium has in large part vanished, leaving a collapsed framework of the mucosa showing a little oedema and invasion of wandering cells.

The fourth day marks the peak of the intoxication, and coma followed by death usually develops at this time. The anatomical and histological picture resembles that of the third day. There is more evidence of mitosis and efforts of repair on the part of the intestinal epithelium.

The stomach is not concerned in this reaction, but the colon may show evidences of slight injury. The colon is obviously much more resistant than the small intestine.

The authors believe the evidence is conclusive that the stormy clinical picture and fatal intoxication are due entirely to the injury to the epithelium of the small intestine.

ADOLPH HARTUNG, M.D.

Warren, S. L., and Whipple, G. H.: Roentgen-Ray Intoxication. III. The Speed of Autolysis of Various Body Tissues After Lethal X-Ray Exposures. The Remarkable Disturbance in the Epithelium of the Small Intestine. *J. Exper. M.*, 1922, xxxv, 213.

In preceding articles on roentgen-ray intoxication the authors submitted evidence that lethal roentgen-ray exposures produce true injury of the epithelial cells of the small intestine involving both the nucleus and the protoplasm. In this article they show that autolysis in these cells is profoundly modified by such exposures. In the experiments on which it is based dogs were killed two, twenty-four, forty-eight, seventy-two, or ninety-six hours after exposure to radiation. The methods employed, the experimental observations, and the findings in several normal control animals are reported in detail.

It was found that exposure to large doses of roentgen rays caused a notable increase in the speed of autolysis of the crypt or secretory epithelium of the dog's small intestine. These changes could be

demonstrated readily in material obtained from dogs killed two, twenty-four, forty-eight, seventy-two, or ninety-six hours after the initial radiation.

In the radiated dogs the secretory crypt epithelium of the small intestine autolyzed first and the epithelium of the villi last, while the reverse was true in the normal control small intestine. These abnormalities of autolysis associated with lethal roentgen-ray exposures could be demonstrated in the small intestine over the whole four-day period subsequent to radiation.

The colon showed little change and the stomach no demonstrable changes in autolysis under like conditions. The kidney also was negative.

The spleen, lymph glands, liver, and pancreas of radiated dogs showed a moderate increase in the rate of autolysis within forty-eight hours of the initial exposure.

What the significance of this disturbance of cell ferments in the intestinal mucosa may be, the authors cannot say. At least these observations strengthen their confidence in the profound functional disturbance of this important intestinal epithelium, a disturbance which they believe is responsible for the clinical abnormalities and fatal intoxication.

ADOLPH HARTUNG, M.D.

Stern, S.: Intensive X-Ray Therapy as Seen Practiced in the Clinics in Europe. *Am. J. Roentgenol.*, 1922, n.s. viii, 741.

Stern reports in detail the main points in the technique employed at the various clinics of Frankfurt, Freiburg, Erlangen, and Berlin. Aside from the virtual agreement as to the necessity for apparatus delivering at least 200,000 volts and as to the employment of heavy filters, he found the greatest divergence of opinion with regard to even vital questions of technique. The varying techniques described may be averaged as follows: distance 30 to 50 cm.; field, 6 by 8 cm. to 25 by 25 cm.; time, one to six or seven hours; filter, $\frac{1}{2}$ to $1\frac{1}{2}$ mm. copper or 0.5 to 0.75 mm. zinc; voltage 180 to 200 kv.; and milliamperage 2 to $2\frac{1}{2}$.

Stern thinks well of the iontoquantimeter employed by Friedrich at Frankfurt, and of the charts designed by Dessauer to show the ray absorption at varying depths. Commenting upon the great divergence in technique he says, "One insists on large and far fields to get the benefit of a larger proportion of depth dose, and another prefers concentration with compression to get nearer to the lesion. Some insist on the importance of applying the entire carcinoma dose within twenty-four or forty-eight hours; others divide it over a period of one week; still others divide it into four weekly doses."

With regard to the erythema dose Stern states that some are satisfied with the slightest appearance, while others insist upon a very decided reaction. There is the most serious and irreconcilable difference of opinion, however, regarding the question as to when an erythema dose should be repeated. Some say not within six months, others repeat in six

weeks, and one clinic applies an erythema dose every month for four or five successive months, considering it not only safe but necessary. Some of these questions, Stern believes, will eventually decide themselves. Treatments of seven hours a day for two or more successive days and, because of the time element, the use of $1\frac{1}{2}$ mm. copper filters are impracticable. The time when an erythema dose may be repeated will be found somewhere between the extremes mentioned. Stern would hesitate to give four or five erythema doses at monthly intervals. On the other hand, he does not believe it necessary to wait six months.

As to the choice of cases, it was found that most of the clinics visited have practically discontinued operating upon all cases of carcinoma of the breast and uterus. They claim that in unselected cases a cure is obtained in approximately 85 per cent. In malignant growths of other organs the results are not so satisfactory. All of the clinics emphasize the fact that sarcoma should never be treated surgically as the chances of metastasis are very much increased by operative interference.

DAVID R. BOWEN, M.D.

Proust and Mallet: Recurrent Epithelioma of the Breast with Limitation of the Recurrence to the Periphery of the Irradiated Area (Epithélioma du sein récidivé avec limitation précise de la récidence au pourtour d'une zone irradiée). *Bull. et mém. Soc. de chir. de Par.*, 1922, xlviii, 195.

In the case reported the breast and axillary glands of a woman 66 years of age were removed for cancer in May, 1921. In August the vicinity of the scar showed redness but the scar itself was normal. Nine treatments with the X-ray were given, but in spite of this the redness and neoplastic infiltration of the skin increased. The recurrence developed in a circular pigmented zone the central portion of which appeared normal. The authors believe that the free spot corresponded to the principal zone of application of the X-rays.

This case shows the high therapeutic value of irradiation and the difficulty of carrying a sterilizing dose to the entire surrounding area. Radium and X-ray therapy given in conjunction with extensive surgical excision should be begun at the periphery of the ablation. Such a procedure would allow the radiation of extensive fields.

W. A. BRENNAN.

Holmes, G. W.: Some Observations on the Treatment of Hyperthyroidism with X-Rays. *Am. J. Roentgenol.*, 1922, n.s. viii, 730.

This article is based upon the X-ray treatment of 369 cases of hyperthyroidism, eight of which are reported in detail. At the Massachusetts General Hospital a goiter committee consisting of a clinician, a surgeon, and a roentgenologist meets once a week and all patients are seen by the committee in consultation. New cases are examined in order that a definite diagnosis may be made as to type and that treatment may be agreed upon. Old cases are

examined before any change is made in the treatment and for observation or discharge.

Metabolism tests are made before, during, and after treatment. Sources of infection and the presence or absence of cardiac or pelvic disorders and an enlarged thymus are determined when possible. The patient's occupation, home life, and distance of residence from the clinic are considered. A photograph of the patient is made and the pulse rate, weight, temperature, and metabolism rate are charted.

Colloidal, cystic, and simple goiters are not treated by radiation. If removal is advisable surgery is recommended. For malignant goiters immediate operation followed by radiation is advised. If surgery is contra-indicated the X-ray alone may bring about a temporary cure. Toxic adenomata respond readily to X-ray treatment but surgery is quicker and, as the surgical risk is slight, most of these cases are referred for operation.

Non-toxic adenomata have not been treated by X-ray though it is possible that localized nodules may be reduced by this method. As a rule these cases are kept under observation or treated surgically. Exophthalmic goiters are usually treated first by rest and radiation. The surgical risk has been found to be greatest in this class of cases and they respond well to radiation. The importance of rest increases with the degree of toxicity. Patients with a very high metabolism are given rest before the X-ray treatment is begun. Radiation reduces the operative risk by destroying the thymus and, if not too prolonged, does not make the operation more difficult. A large percentage of cases so treated never come to operation.

From our present knowledge it is fair to assume that when the thyroid gland is radiated the function of the gland itself is inhibited. As the dose is increased these cells atrophy and disappear, to be replaced by connective tissue. Later the contraction of this new fibrous tissue may interfere with the blood supply and still further inhibit glandular function. Therefore the dose should be adapted to the type of case. It must also be kept within the limits of skin tolerance. Holmes has employed an 8-in. parallel spark gap, a 4-mm. aluminum filter and, in the early cases, an 8-in. skin target distance. Later a 10-in. and, in some cases, a 16-in. distance was used. In most of the cases three areas were exposed, one at each side of the neck and one over the thymus. In some cases, with the use of a 16-in. distance, the area exposed included the entire thyroid and the upper portion of the thymus. The interval between treatments is usually three weeks.

In striving for the maximum effect short of an erythema dose Holmes believes it is safer to diminish the interval rather than to increase the dosage. Basal metabolism tests are made frequently and when the rate reaches normal the treatment is stopped. If the drop has been rapid it is stopped sooner. In cases which respond favorably an improvement in the nervous symptoms is usually

noted at the end of the first three weeks. Frequently a severely toxic patient is able to return to work after the third treatment, and from that time the treatment need not interfere greatly with his routine. In cases which are more stubborn, rest should be insisted upon or surgery resorted to after the fourth or fifth treatment.

It is not desirable to prolong the treatment as its prolongation will make the operation more difficult. In Holmes' experience, however, the difficulty of operation has not been increased by four or five treatments given within a period of six months. Untoward skin effects such as atrophy and telangiectasis may be avoided by keeping well under the erythema dosage; if not avoided they may be more disfiguring than the surgical scar.

DAVID R. BOWEN, M.D.

LEGAL MEDICINE

No Malpractice in Treatment of Knee and Abscesses. *Hanson vs. Harris (S. D.), 184 N.W.R., p. 262.*

The plaintiff's right knee was run over by a wagon wheel. A physician was called, but the knee soon became very much swollen, inflamed, and very painful. About two weeks after the injury the defendant was asked to treat the case and moved the plaintiff to his hospital. On opening the knee joint the defendant found a large cavity extending 5 in. above the knee, which was filled with thin seropurulent pus. A number of abscesses containing pus had formed about the knee. The defendant made four incisions, drained and cleaned out the abscesses, and applied the proper drainage and irrigation. By examining with his finger inserted through the incision into the cavity of the knee, he found that there was no fracture of any of the bones. The joint was badly infected, however, and the bone had become infected to some extent.

Following this treatment the swelling and the temperature went down, and about ten days or two weeks after the plaintiff entered the hospital the defendant injected Beck's paste into the joint abscesses and pus cavities. Soon thereafter another abscess formed on the calf of the leg, but healed quickly after it was opened, drained, and irrigated. At the end of five or six weeks the plaintiff was discharged from the hospital as cured. His knee was then nearly stiff and so bent that when he stood up only his toes touched the ground. Eight months later he went to another hospital where the knee joint was opened and necrosis of the bones of the joint, especially of the lower end of the femur, was discovered. Small quantities of Beck's paste were found also in the joint, and a roentgenogram taken some months later showed that some of the paste still remained in the cavities formed by the abscesses.

After a thorough analysis of the testimony the court failed to find any facts that warranted the conclusion that the defendant was negligent or unskillful in his treatment of the plaintiff's injury or that

any other course of treatment known to the medical profession would have produced better results. The plaintiff had suffered much pain and no doubt would continue to suffer great pain and much inconvenience from the condition of his leg. The mere fact that his leg was not restored to its normal condition and function did not prove, or even imply, that the defendant was negligent or unskillful. Physicians and surgeons are not to be held for results, but only for the kind of service rendered by them.

It was argued that the use of Beck's paste was unnecessary and under the circumstances was improper treatment because the paste was intended to be applied to cases of chronic or tuberculous abscesses, while the abscesses in this case were acute. The defendant, however, appeared to have used the paste in the exercise of his best judgment that it was necessary to hasten the healing of the abscesses about the knee. The court did not agree either with the contention that the defendant should have kept the leg in splints in order that, if it was to be stiff, it would be straight instead of bent. The leg was splinted for some time, but as the defendant believed that the knee joint would not be entirely stiff after it healed, the splint was removed.

J. A. CASTAGNINO.

Treatment of Alleged Osteomyelitis with Vaccine—Mistakes in Judgment. *Edwards et al. vs. Uland (Ind.)*, 131 N.E.R., p. 240.

The plaintiff alleged that the defendants had carelessly and negligently advised and used the vaccine treatment for osteomyelitis in the upper part of his left arm. The evidence showed that after obtaining the history of the case the defendants stripped the patient to better observe the results of past ailment and treatment. There were numerous scars due to operations. Because of a history of osteomyelitis, they made use of the common tests to discover the presence of that disease, viz., the determination of the blood pressure, a blood count, microscopic examination of the blood for infection, urinalysis, and a roentgen-ray examination of the affected arm. The latter appeared to show a normal condition of the bone. The findings indicated that there was no osteomyelitis at that time and no need for a surgical operation. Vaccine treatment was therefore believed to be the proper treatment.

The court stated that the defendants did not admit they were mistaken in the method of their treatment, but even if they had been, this was not of itself sufficient to require them to respond in damages. When there is a reasonable doubt as to the nature of the physical conditions involved or as

to what should be done in accordance with recognized authority and good current practice, a physician is not ordinarily liable for damages consequent on an honest mistake or error in judgment in making a diagnosis, in prescribing a treatment, or in determining whether an operation is necessary. One surgeon possessing great learning and skill might perform a certain operation when another of equal learning and skill would not perform such an operation, the difference being due to their judgment as to the necessity for the intervention.

There is no presumption of negligence or want of skill from a failure to cure. The mistake of the physicians in this case, if any, was in determining after careful diagnosis the method of treatment that they would follow—in assuming that a cure would be effected by the use of vaccines without surgery. If there had been a question as to whether they were careless and negligent or unskillful in the use of the method chosen, there would have been a question for the jury as to a fact. Under the facts proved, there was at most only a mistake in judgment after a careful diagnosis of the case. Therefore the judgment entered on a verdict in favor of the plaintiff was reversed and instructions were given the trial court to grant a new trial.

J. A. CASTAGNINO.

Roentgenograms as the Best Evidence. *Daniels vs. Iowa City (Iowa)*, 183, N. W. R., p. 415.

The supreme court of Iowa, in affirming a judgment in favor of the plaintiff for damages for personal injuries, stated that the record showed that an expert was permitted to testify as to what roentgen-ray photographs show, how they are taken, how conditions are indicated thereon, and as to his physical examination of the plaintiff. The court appreciates that too strict an application of the best evidence rule as applied to roentgen-ray photographs is not desirable, but it could not be said that any prejudice resulted in sustaining the objections to the questions propounded.

It is proper for an expert to explain a roentgen-ray photograph in the particulars that are not understood by a layman. What the jury could see and understand about the matter is not the subject of expert testimony, and this the supreme court understood to be the effect of its prior decision. A roentgenogram may be used for purposes of demonstration by an expert as if he had the object itself before the jury for explanation. That bone can be distinguished from the flesh in a roentgen-ray photograph, and that bone makes a heavier shadow than muscle is proper expert testimony. Such scientific facts are not known by the average layman.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Mironowa, S. M.: Two Cases of Perforation of the Uterus with Penetration of the Abdominal Cavity by a Bougie (Zwei Faelle von Uterusperforation mit Austritt des Bougie in die Bauchhoehle). *Sborn. rabot po akusch. i ginek.*, 1921, i, 112.

The number of induced abortions has greatly increased in Russia during recent times and there has been a corresponding increase in the serious complications caused by foreign bodies inserted into the uterus for the purpose of inducing abortion.

In the first case reported by the author a bougie was inserted by a midwife into the uterus of a non-pregnant woman 21 years old because of the suspicion of pregnancy. The bougie disappeared within the next few days. Twelve days later a median laparotomy was done. The bougie was found in the abdominal cavity among adhesions in the right anterior fornix. The uterus showed a small depression with a blood clot. Removal of the bougie was followed by recovery.

In the second case a midwife introduced a bougie twice into the uterus of a woman 26 years old who had been pregnant for 2½ months. The bougie disappeared, and the midwife, thinking that it had fallen out, inserted another. Pain necessitated its removal, and on the fourth day the patient entered the hospital. A laparotomy disclosed a local purulent peritonitis and the bougie lying free in the posterior part of the pouch of Douglas and directed toward the cæcum and appendix which were covered with pus. The uterus showed a perforation in its posterior wall. Hysterectomy was done, the stump covered with peritoneum, the abdominal cavity closed, and the vagina drained. Recovery followed.

SCHAAK (Z).

Proust, R., and Mallet, L.: The Respective Indications for Hysterectomy, Radium Treatment, and Penetrative Radiotherapy in Cancer of the Cervix of the Uterus (Des indications respectives de l'hystérectomie, de la curiethérapie et de la radiothérapie pénétrante dans le cancer du col de l'utérus). *Presse méd.*, Par., 1922, xxx, 89.

A study of published statistics shows that following surgical treatment of cervical cancer the number of patients with recoveries lasting more than five years is little more than 30 per cent of the number of those surviving the operation.

Following radium therapy not more than 20 per cent of the patients survive more than five years.

Following penetrative roentgenotherapy the survivals for more than five years equal 60 per cent in operable cases and 23 per cent in inoperable cases, while the average for all is about 30 per cent. After five years the percentage of survivals falls to 20 per cent.

Radium therapy and roentgenotherapy have a lower immediate mortality than operative treatment but operative treatment is followed by longer survival.

With regard to the method of treatment indicated the authors classify cancer cases into the following four groups irrespective of the nature of the cancer as revealed by biopsy:

1. Clearly early cases in which the uterus is still mobile.
2. Cases still clearly operable, but with invasion of the ligaments.
3. Cases with inoperable ligamentary invasion, but in which the general condition is good.
4. Very advanced cases.

In the first class radical operation should be done. The surgeon must be sure to reach healthy tissue. In such cases the operative mortality is low and surgery offers a better prognosis than any other treatment. Frequently the operation should be preceded by a vaginal application of radium but the delay must not exceed three weeks. Also it is of advantage to give penetrative X-ray treatment of the broad ligaments at least one month after the operation to destroy any malignant cells that may have remained in the pelvis.

In the second class of cases, in which there is invasion of the broad ligaments, operation offers less certainty of cure and it is better to use radium therapy which gives as complete destruction and has a much lower mortality rate. The application of the radium to the uterus and vagina, however, is not sufficient. It must be placed in the midst of the broad ligaments or its action must be immediately supplemented by penetrating irradiation of the parametrium with the X-ray.

In inoperable cases in which the patient's general condition is good there is considerable danger of fistula formation following radium therapy. Therefore the principal treatment should be irradiation with the X-ray, radium being used only as a supplement and applied within the uterus or abdomen but never within the vagina.

In very advanced cases the X-rays should be employed, but with care to avoid massive dosage.

Other factors to be considered in the choice of treatment are the time which has elapsed since the beginning of the condition and the nature of the development, and the histologic type of the tumor.

In cases of rapidly developing tumors the following three facts should be borne in mind:

1. For the destruction of the cancerous cell the method must have an immediate effect.
2. Radium has a rapid action (fifteen days).
3. Penetrating irradiation has a slow action (about six weeks).

The type of neoplasm is important. In cases resisting radiotherapy operative intervention may find new indications besides those mentioned.

For postoperative destruction of cells the authors accept radium therapy and reject roentgenotherapy, but as supplementary treatment to operation they recommend roentgenotherapy and reject radium therapy. They strongly recommend extended radiotherapy given by the intra-abdominal application of radium with or without associated penetrative roentgenotherapy.

They reject roentgenotherapy for pre-operative destruction of malignant cells because of the cutaneous changes it produces which are unfavorable to cicatrization. Radium therapy as a postoperative adjuvant is rejected because its principal (intra-uterine) use is rendered impossible by the removal of the uterus.

W. A. BRENNAN.

ADNEXAL AND PERI-UTERINE CONDITIONS

Polak, J. O., and Welton, T. S.: A Study of the Origin of Bleeding in Ectopic Pregnancy. *Am. J. Obst. & Gynec.*, 1922, iii, 164.

The authors' studies have shown:

1. That a decidual reaction may be found at several points in the tube in ectopic points often far remote from the seat of implantation.

2. That coincident with the separation or death of the ovum due to hæmorrhage into the decidua there is bleeding from the uterus and from the several points of decidual reaction in the tube.

3. That tubal peristalsis and the vis à tergo of the clot in the tube expel blood from the abdominal ostium into the peritoneum, and that this blood gravitates into the cul-de-sac.

4. That the same factors contribute a portion of the blood making up the bloody discharge from the uterus which signifies the separation or death of the embryo.

E. L. CORNELL, M.D.

Hirschfeld, T.: The Surgical Treatment of Inflammatory Tumors of the Adnexa (Die operative Behandlung der entzündlichen Adnextumoren). Dissertation: Berlin, 1921.

The chief cause of inflammatory tumors of the adnexa is gonococcal infection. It is believed that 50 per cent of inflammations of the adnexa are of gonorrhœal origin. In the less frequent septic and putrefactive processes the streptococcus, staphylococcus, and bacillus coli play the largest part. In these cases also the infection is usually an ascending one, the bacteria reaching the tubes by way of the uterus. Tubercle bacilli are found as excitants in only about 10 per cent of all diseases of the adnexa. The infection is usually secondary, being carried by way of the blood stream. The possibility of tuberculous infection through coitus is disputed.

The treatment of inflammation of the adnexa should at first be conservative, whatever the cause. In from 70 to 90 per cent of cases such treatment effects a cure. In some instances, however, expectant

measures are useless and operation is indicated. It is usually in the cases of women of the working classes who cannot take sufficient rest to allow the inflammatory process to quiet down that cure can be obtained only by operation. These are usually cases of tumors of the adnexa in a subacute or chronic stage.

The question arises whether operation is indicated also when an acute septic process is present, a rapid enlargement of the pyosalpinx can be determined, and there is danger of rupture of the pus sac. Doederlein and Kroenig refuse to operate in these cases. If operation must be performed, the abdominal route is preferable to the vaginal as in the latter there is greater danger of injuring the intestine.

For the skin incision Pfannenstiel's transverse incision is usually to be preferred. If the patient is young, only the adnexa should be removed but in the cases of those in or near the climacteric the uterus also may be removed, a procedure which gives particularly good results.

In Faure's method, which is widely recommended, the uterus is first split down and then the tumors of the adnexa are loosened from adhesions by traction and freed from the uterus. Over against these more or less radical operative methods for tumors of the adnexa of gonorrhœal origin stands the conservative surgery which must be employed if cessation of function is to be avoided in the cases of young women. In such cases one is limited to resection of the tubes. A wedge-shaped excision of their interstitial portion is recommended. If the ovary on one side is involved, it must be removed as well. In bilateral disease of the ovaries an attempt should be made to preserve at least a portion of one ovary in order not to arrest ovulation and menstruation. If there is occlusion of the tubes unassociated with more severe inflammatory changes and giving no trouble except sterility, mutilating operations must be avoided. Recently, repeated attempts have been made in such cases to restore the function of the tube by the formation of an artificial ostium.

It is often very difficult to determine with certainty whether disease of the adnexa is tuberculous or not. Usually this can be done only by the process of exclusion. In general, tuberculosis of the genital organs shows a strong tendency toward healing. Consequently there is seldom an urgent indication for the removal of tuberculous tumors of the adnexa. However, if the disturbances are so great that surgery is necessary the operation should be as conservative as possible; that is, it should be limited if possible to removal of the tubes, especially since, as a rule, the patient is a young woman.

DENCKS (Z).

Janney, J. C.: Report of Three Cases of a Rare Ovarian Anomaly. *Am. J. Obst. & Gynec.*, 1922, iii, 173.

The three cases reported showed the presence of uterine tissue in the ovary. They were found in going over 4,853 pathologic specimens at the Free

Hospital for Women, Brookline, Mass. They were all discovered incidentally, the operations having been performed for other conditions which had not directed attention to the ovaries primarily.

E. L. CORNELL, M.D.

Martzloff, K. H.: Dermoid Cysts of the Ovary; A Report of Four Cases. *Bull. Johns Hopkins Hosp.*, 1922, xxxiii, 66.

In discussing four cases of dermoid cysts of the ovary the author emphasizes:

1. The importance of puncturing the ovary or a small ovarian cyst for diagnostic purposes when conservation is to be practiced.

2. The value of routine examination of all pathologic tissue removed at operation.

3. The feasibility of conserving a portion of normal tissue of one or both ovaries, even in the presence of a dermoid growth, in order that thereby the danger and inconvenience of an operative menopause may be avoided.

Only one case of dermoid cyst in association with, and included in, the wall of a multilocular pseudomucinous cystadenoma of the ovary has been observed in the Johns Hopkins Hospital.

The incidence of malignant changes in a dermoid cyst in the Johns Hopkins Gynecological Clinic is 1 per cent.

HARVEY B. MATTHEWS, M.D.

EXTERNAL GENITALIA

Payne, R. L.: A Technique for the Repair of Relaxed or Lacerated Perineum. *J. Am. M. Ass.*, 1922, lxxviii, 574.

The salient features of the technique which has been used by the author satisfactorily for ten years are: (1) the complete liberation of the entire rectocele from the muscles and fascia of the perineum to permit a thorough reduction of the herniated portion of bowel; (2) the insertion of only nine stitches; (3) the use of interrupted sutures; and (4) simplicity and ease of execution of the operation.

One Allis forceps is placed at the highest point of the rectocele where the anterior and posterior vaginal walls meet, and another at a slightly higher level on

either side at the edge of the labia minoris. The rectocele is separated from the levator ani by an incision and the rectum is freed from the muscles and fascia so that a crescentic shelf is formed.

One suture is applied in each sulcus, picking up only vaginal fascia and mucous membrane. The rectocele being reduced with a rigid instrument, a second suture passes over and catches the vaginal fascia and mucosa at the central point. This suture is not tied until the entire approximation is completed. Three interrupted sutures beginning and ending at a point half way between the levator shelf and the skin margin are then inserted and tied to maintain the reduction of the rectocele.

A second row of sutures is begun just under the skin margin to approximate the second plane of muscles and fascia. These are inserted on a plane between the first three approximating sutures. The skin is closed with loose sutures of plain catgut.

The different steps are illustrated by six sketches.

C. F. ANDREWS, M.D.

MISCELLANEOUS

Gruss, J.: Surgical Treatment of Malformations of the Internal Genital Organs (Operative Behandlung von Missbildungen des inneren Genitals). *Rozhledy v chir. a gynaek.*, 1921, i, 185.

Laparotomy is preferred by the author in the majority of cases of malformation of the internal genital organs as it permits exact inspection of the organs within the abdominal cavity. He recommends laparotomy unconditionally in pregnancy in the rudimentary horn of a bicornate uterus, high gynatresia, particularly when it is complicated by hæmatosalpinx, in hæmatometra in a rudimentary horn of the uterus, and in dysmenorrhœa due to rudimentary development of the uterus.

In complete absence of the vagina Baldwin's method of substitution is recommended. Rudimentary development of the uterus is not a all so rare as might be inferred from the literature. A diagnosis of complete absence of the uterus, on the other hand, is erroneous as traces of this organ can always be demonstrated in the subperitoneal region.

KINDL (Z).

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Fruhinsholz, A., and Parisot, J.: Anomalies of Thyroid Function in Their Relation to Pregnancy (Des anomalies de la fonction thyroïdienne dans leurs rapports avec le gestation). *Gynec. et obst.*, 1921, iv, 169.

The authors have made a collective review of the literature, separating the experimental and clinical observations and summing up the outstanding conclusions of the various reporters.

They discuss the experimental reports under the following general heads: (1) the influence of gestation on the thyroid gland in the normal state, (2) gestation and hyperthyroidism, (3) gestation and hypothyroidism, and (4) the offspring of animals with thyro-parathyroid insufficiency.

Many observers have noted that during pregnancy the weight of the thyroid is increased both absolutely and relatively. Borzytowski, who studied the structure of the gland during pregnancy, found many signs of increased secretion such as the formation of new follicles, a deeper staining property of the cells, and an increase in the colloid content and the blood supply. In the parathyroids of the pregnant cat he found also karyokinetic figures which Civalier did not find in man. Lange even diagnosed a pregnancy from the enlargement of the thyroid before any other signs were apparent.

As a possible etiological factor the functional relationship between the thyroid and the corpus luteum or the placenta or fœtus is mentioned. Repeated injections of extract of the placenta of rabbits injected into three virgin rabbits produced an enlargement of the thyroid as well as an enlargement of the hypophysis and adrenals.

The experimental data on gestation and hyperthyroidism are very variable and unsatisfactory as the physiological state of hyperthyroidism is difficult to produce.

In the discussion of gestation and insufficiency of the thyroid insufficiency of the parathyroids is included. The reader is referred to the monographs of Jeandelize on thyroid and parathyroid insufficiency (1902), and of Morel on the parathyroids (1912) for details of the functional relationship of these closely associated glands.

In the young, thyroid insufficiency arrests the development of the genital organs and, occurring later, causes sterility due to atrophy of the ovarian follicles (Hofmeister). For fecundation and the evolution of pregnancy the secretion of the thyroid is much more important than that of the parathyroids. Thyro-parathyroidectomy practiced on pregnant animals usually causes abortion, premature labor, or stillbirth. If the pregnancy goes to

term and live young are born, the mother is apt to develop tetany.

The effects on gestation, parturition, and postpartum states were studied by removing as much of the gland as possible without destroying life or preventing fecundation. The results were uniform and showed that the pregnant animal is very much less able to stand the operation than the non-pregnant animal. The chief accidents which occurred were convulsions causing death, tetanic phenomena, albuminuria, and hepatic and renal alterations. Tetany is especially apt to develop, the parathyroids being apparently alone responsible for this. The non-pregnant animals almost invariably showed no reaction unless they later became pregnant, when tetany usually developed.

In separate studies of the effects of deficiency of the two glands it was found that convulsions and the phenomena of intoxication, such as dyspnoea and urinary disturbances, are due to deficiency of the parathyroids, while the trophic disturbances causing falling of the hair, apathy, etc., are due to deficiency of the thyroid. The effects of deficiency of these glands are sometimes delayed until after parturition. Successive pregnancies increase the severity of the disturbances. The mammary secretion is not affected.

The conclusions drawn regarding the relation of thyroid insufficiency to pregnancy are as follows:

1. Pregnancy, labor, and postpartum conditions do not modify the animal's general condition.
2. Signs of thyroid insufficiency are increased in the course of or after the gestation.
3. In the course of the gestation, at the approach or time of labor, or postpartum, more or less characteristic phenomena of tetany appear which may cause death or disappear quickly after the delivery or the suppression of the mammary secretion.
4. The same phenomena appear in the course of a second or third pregnancy when they had not been manifested previously.
5. In certain cases these phenomena are favorably influenced by injections of thyroid extract.

In the offspring of mothers with thyroid insufficiency rickets is frequently present. Long has noted a decrease in the weight of the eggs of fowls. Iselin, working on parathyroidectomized rats, found that the offspring were hyperexcitable to the galvanic current. Almagia noticed that young puppies seemed somnolent when nursing a dog with thyroid insufficiency. Therefore thyroid insufficiency must be considered before definite conclusions can be drawn regarding heredity.

The clinical material is discussed under the following headings: (1) hyperthyroidism, (2) hypothyroidism, and (3) instable thyroids.

Hyperthyroidism exists in varying degrees and almost all the minor complications of pregnancy, including glycosuria, insomnia, vomiting, sensitization to tuberculosis, etc., have been attributed to it by various writers.

Several cases are cited in which typical Basedow's disease developed during pregnancy and subsided after delivery. In one case the hyperthyroidism appeared again during a subsequent pregnancy.

The study of the effects on pregnancy of a pre-existing hyperthyroidism is difficult because of the lack of material, only about eighty cases having been reported from the large obstetrical centers. Of seventy-eight cases, forty were aggravated by pregnancy, twenty-two benefited, and sixteen unaffected. Cases complicated by mechanical action or a cardiac condition are most apt to be aggravated. The authors state that after fecundation hyperthyroidism has little effect upon gestation but according to some investigators it tends to cause abortion, and according to others it predisposes to complications such as albuminuria, oedema, persistent vomiting, placental hæmorrhages, and hypertension.

The chief indications for surgery of the gland during pregnancy are mechanical embarrassment and malignancy.

There is no predisposition to hyperthyroidism following gestation.

Hypothyroidism may be congenital, the result of the surgical removal of the gland, or due to replacement of the gland by a new growth.

Because of faulty sexual development women with congenital hypothyroidism do not become pregnant.

Surgery of the thyroid during pregnancy is frequently followed by tetany due to interference with the parathyroids. It is only when trophic disturbances occur that the thyroid is responsible.

Tetanic cramps are probably confused with eclamptic convulsions.

Levy believes that the thyroid does not respond early in pregnancy and that therefore there is an initial stage of hypothyroidism which explains some of the early disorders.

The myxoedematous patient rarely becomes pregnant. Some of the syndromes attributed to hypothyroidism, such as migraine, asthma, etc., are occasionally greatly relieved during pregnancy, but return after delivery. Most of the observations on the definite myxoedema syndrome, however, indicate that the condition is aggravated by pregnancy. As in hyperthyroidism, the course of the pregnancy itself is affected very little by the hypothyroid state.

Under the term "instable thyroids" are classed several cases in which pregnancy changes symptoms of hypothyroidism into those of hyperthyroidism and vice versa. The statement is made that the hyperthyroidism which appears as a reaction to pregnancy may subside following the administration of thyroid extract.

The offspring of mothers with instable thyroids seem to show a predisposition to internal glandular disturbances the nature of which cannot be predicted.

The conclusions drawn from the clinical material are as follows:

1. Gestation physiologically causes a state of compensatory hyperthyroidism which tends to assert itself in the second half of pregnancy.

2. This hyperthyroidism may pass the limits of a strictly compensatory reaction and become pathologic. It may manifest itself in any stage of gestation and sometimes appears only after labor, as if the thyroid had been maintained in a natural state by the gestation.

3. A previous hyperthyroidism is generally unfavorable for fecundation. If fecundation takes place the symptoms are frequently ameliorated but occasionally may increase, especially in the presence of mechanical pressure or a cardiac lesion.

4. Hypothyroidism is even less favorable for fecundation. If fecundation occurs the symptoms may be ameliorated by the response of the thyroid gland to the stimulus of pregnancy, they may be aggravated if the gland cannot respond, or they may remain unchanged.

5. There is a relationship between tetany and the state of gestation and between tetany and insufficiency of the parathyroids.

6. A latent parathyroid insufficiency may be revealed by tetany during gestation.

7. If a pregnancy occurs either in the hyperthyroid or hypothyroid state it nearly always terminates normally. If complications develop they are usually manifested by symptoms of auto-intoxication such as albuminuria, oedema, etc.

8. Certain children of mothers with a profound alteration of thyroid function have a predisposition to glandular disturbances which are not necessarily the same as the disturbances in the mother.

The conclusions from the clinical studies are in general identical with those drawn from the experimental studies, especially those concerned with the diminution or absence of the thyroid or parathyroid function. The influence of the alterations on the human foetus, however, appears to be less marked.

An extensive bibliography is appended.

C. L. HARTSOCK, M.D.

LABOR AND ITS COMPLICATIONS

Speidel, E.: An Analysis of the Potter Version. *Am. J. Obst. & Gynec.*, 1922, iii, 150.

Speidel discusses Potter version on the basis of a visit to Potter and a limited experience with his method in private and hospital practice. He sums up his opinion of Potter's methods as follows:

1. Potter version is such a decided improvement over all the old established procedures that it should supplant all other methods of performing podalic version.

2. The delivery of the child after the version has been performed is such a marked advance over the old methods of breech delivery that it should supplant the latter at once.

3. Potter's effective treatment of the child at birth by gentle rational manipulations is so superior to the many rough treatments to which the asphyxiated baby has been subjected heretofore that it should be used by every obstetrician.

E. L. CORNELL, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Balard, P.: Secondary Immediate Perineorrhaphy
(La périnéorrhaphie immédiate secondaire). *Rev. franç. de gynéc. et d'obst.*, 1922, xvii, 12.

By the term "secondary immediate perineorrhaphy" Balard means any repair of the perineum made during the puerperium, whether a delayed immediate suture or repair following the failure of a perineorrhaphy done immediately after delivery.

Secondary perineorrhaphy has its origin in the contra-indications and failures of primary immediate perineorrhaphy. The causes of rupture of a primary perineorrhaphy are varied and numerous.

Ordinarily the time for a secondary perineorrhaphy is between the tenth and twentieth days. It varies, however, according to the conditions of the particular case, but the operation should not be undertaken until fever has been absent for at least three days. Favorable conditions will be hastened by careful attention to the vaginal discharge and the use of horse serum.

The technique must be varied according to whether the perineal laceration is complete or incomplete. The patient should be prepared as for a surgical operation. Cocaine anesthesia is sufficient. The wound is first cleared of granulations with the curette and the freshening completed by resecting 1 or 2 mm. of tissue from the edges of the tear. A cicatricial zone is thus removed and the two edges are prepared so that they will fit together symmetrically. If the tear is complete it will be necessary to detach the vaginal septum from the rectum. Several rows of deep catgut sutures must be placed on the vaginal portion of the tear if it is complete, but only one row if it is incomplete. A serous myorrhaphy of the levators and a drawing together of the deep planes to obliterate dead spaces complete the intervention.

W. A. BRENNAN.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Wright, H. W. S.: A Study of the Surgical Pathology of Hypernephromata: With Special Reference to Their Origin and Symptomatology.
Brit. J. Surg., 1922, ix, 338.

This article is based upon research regarding the pathology of tumors arising in the renal cortex of man and animals. The author emphasizes the fact that the diagnosis must be made from sections from different portions of the growth rather than from one section alone. Hypernephromata are rare, only six cases having been found among 10,500 cases of cancer, but they form 65 per cent of renal tumors. They occur with equal frequency on both sides of the body. Males are affected slightly more frequently than females. As a rule the growths develop between the fiftieth and sixtieth years of age but they have been found in childhood also.

The most common initial sign is hæmaturia which occurs in 10 per cent of cases. Fever is frequently present even in the absence of infection, being due to the entrance into the blood stream of small amounts of foreign protein detached from the growth and causing an anaphylactic reaction.

The hæmaturia is of two types: (1) small in amount, intimately mixed with the urine, and due probably to blocking of the smaller veins by the growth which causes hæmorrhage into adjacent tubes; (2) profuse hæmaturia associated with the passage of clots and renal colic and due probably to involvement of the pelvis or invasion of one of the larger veins in the renal cortex. The second type usually occurs at a later stage than the first and is present in most cases.

Another common sign of hypernephroma is pain. This is of three types: (1) renal aching, which is common to all cases in which there is blockage of the outlet; (2) renal colic associated with the passage of clots; and (3) acute attacks of pain in the kidney associated with extensive hæmorrhage into the growth. In a study of his cases the author was unable to find any definite relationship between the size of the growth and the pain complained of.

Retention of urine, difficulty of micturition and frequency are rare symptoms. Tumor is a prominent clinical feature. In the diagnosis the author places most reliance upon the cystoscopic examination, blood-urea estimations, and the indigocarmine test. The X-ray may also be of assistance. Emphasis is placed upon the necessity of excluding chronic interstitial nephritis.

The results of treatment of hypernephroma are not very encouraging. The great vascularity of the growth and its tendency to invade the renal vessels favor dissemination by the blood stream. A study

of the growth and macroscopic pathology of these tumors raises the hope that local recurrence may be prevented by a more thorough removal of the perirenal fat. Examination of specimens showed little extra-renal infiltration but revealed invasion of the renal vein which was appreciable to the naked eye and made the prognosis almost hopeless. Specimens show that hypernephroma may occur in any part of the kidney.

Macroscopically hypernephromata are distinguished from other renal tumors by: (1) compressed renal tissue surrounding the growth and resembling a capsule; (2) the presence of yellow areas of degeneration; and (3) hæmorrhage and necrosis in the growths themselves.

The growths vary greatly in size. In shape they are generally spherical. They are divided into segments by fibrous trabeculae each of which surrounds an artery. Microscopic study shows that in structure they are essentially papillary. Their appearance varies with the direction in which the sections are cut and the way the stroma runs. The shape and appearance of the cells vary greatly. From these variations several types may be distinguished: (1) those with a transverse perivascular arrangement; (2) those with a longitudinal perivascular arrangement; and (3) those of the looped capillary type.

In conclusion Wright reviews the various main theories which have been put forward to explain the origin of hypernephromata. Grawitz believed they arose from suprarenal rests. Sudek and Stock traced their origin to the renal tubules. In Wilson's opinion they develop from remnants of the wolffian bodies. Wright agrees with Sudek and Stock.

The article gives case histories and numerous photographs of kidneys. M. R. FLYNN, M.D.

Fronstein, R. M.: The Complications of Nephrectomy (Ueber bei Komplikationen bei Nephrektomie). *Nautschnaja med.*, 1921, i, 819.

One of the most frequent accidents in nephrectomy is the opening of the peritoneum. If suturing is done immediately, complications are usually avoided. In two cases of secondary nephrectomy for renal fistula, however, this injury resulted in a fatal peritonitis.

The development of a faecal fistula is to be feared from the loosening of close adhesions to the colon. Therefore when such adhesions are present it is best to do a primary intestinal resection. In one case of renal tumor adherent to the cæcum Martynoff performed a nephrectomy and at the same time resected the cæcum and did an ileotransversostomy. The results were good.

Intestinal gangrene is a rare complication of nephrectomy which is to be ascribed to lack of

gentleness on the part of the assistant who aids in displacing the kidney by pressure on the anterior abdominal wall. The author has not seen intestinal hæmorrhage following nephrectomy. In 206 renal operations in Fedoroff's clinic in Petrograd this complication occurred four times; it may be explained as due to venous thrombosis of the mesentery. Injuries of the pleura, which are not very rare, may be followed by pneumothorax and empyema. If immediate suture is done, however, complications are avoided.

Hæmorrhage is the most dangerous complication of nephrectomy. Its source may be the normal renal vessels, supernumerary renal vessels, the vena cava, or the iliac artery. The renal pedicle should not be ligated as a whole; the ureter should always be isolated and the artery and vein tied separately as otherwise there is great danger of slipping of the ligature. Special renal clamps which are allowed to remain in the wound are not absolutely safe as hæmorrhages have occurred even after a clamp has been kept in position for three days. The possible presence of supernumerary renal arteries should always be taken into consideration. With regard to injuries of the vena cava the author states that he has collected twenty-five cases from the literature, twelve of which ended in recovery and thirteen of which were fatal. The means used to stop the hæmorrhage were tamponade twice (both patients recovered), the application of a clamp to the rupture in five cases (two recoveries and three deaths), parietal ligation in three cases (one recovery and two deaths), parietal suture in eight cases (two recoveries and six deaths), double ligation of the vena cava in six cases (all of the patients recovered), and simple ligation twice (both patients died).

The retrograde emptying of the urine from the bladder through the stump of the ureter is a rare complication. This is caused by dilatation of the ureter and vesical spasm, especially in tuberculosis of the bladder. Operative interference has been necessary for this complication only in very rare instances.

From time to time sacculated suppurations requiring surgical treatment have been found in the stump of the ureter following nephrectomy for pyonephrosis. The author reports such a case in which three operations were done. The ureteral stump must be given very careful attention, especially in tuberculosis of the kidney, as otherwise obstinate fistulæ frequently result. Extensive or even total resection of the ureter is not good treatment for this complication as these operations are major procedures and they do not positively prevent the formation of fistula since occasionally tuberculous foci are present in the bladder itself. Therefore the ureter should be resected only so far as it can be done without difficulty and the stump should be doubly ligated with catgut, crushed with a clamp, and burned through with the thermocautery.

The most important and well known complication following nephrectomy is anuria due to functional inefficiency of the remaining kidney. Even when the

most accurate functional tests are made, such an occurrence cannot be excluded with absolute certainty. The author reports a case of this kind from his own experience. Following a gunshot injury of the right kidney, the left kidney showed good function (no albumin in the urine and normal values in the phlorizin and indigocarmin tests), but anuria occurred after nephrectomy performed under morphine-ether anaesthesia. Edebohls' decapsulation of the kidney was done after thirty-nine hours but death followed sixteen hours later. Autopsy showed an acute parenchymatous nephritis.

In conclusion, Fronstein mentions as a complication of nephrectomy the presence of blood in the urine during the first few days following the operation. The systematic search for blood corpuscles in the urine after nephrectomy showed their constant presence during the first four or five days, even when the other kidney was normal. PETROFF (Z).

Sanes, K. I.: Ureteral Obstruction: Failure to Recognize the Condition as a Frequent Cause of Unnecessary Operation. *J. Am. M. Ass.*, 1922, lxxviii, 475.

Ureteral obstruction, though not uncommon, is frequently overlooked. Its disturbances, therefore, are often misinterpreted and improperly treated. The author reports three cases and discusses some of the causes of diagnostic errors. Failure to recognize ureteral obstruction is due chiefly to the variety of its causes and secondary urological changes, and to the anatomical relations of the ureter to adjacent organs. Sanes has found that of all the abdominal organs the appendix is most commonly involved in such diagnostic errors. Next most frequently involved are the pelvic organs in the female because of their relation to the ureters and the not uncommon exacerbation of ureteral disturbances during menstrual periods. Disturbances caused by ureteral obstruction are incorrectly attributed also to diseases of the rectum, colon, ileum, seminal vesicles, etc.

The author calls attention to the importance of good clinical histories, a physical examination of the urinary tract and organs adjacent to the ureter, careful urinalysis, and an investigation of the urinary tract with the aid of cystoscopy and urography. Diagnostic measures in ureteral obstruction are discussed in detail. Sanes regards urography as the most valuable aid in the diagnosis of ureteral obstruction.

E. F. HESS, M.D.

BLADDER, URETHRA, AND PENIS

Nordmann, O.: Obliteration of a Vesicorectal Fistula and the Repair of a Defect in the Urethra (Geheilte Blasen-Mastdarmfistel und Ersatz eines Harnroehrendefektes). *Ztschr. f. Urol.*, 1921, xv, 473.

Nordmann reports the case of a 9-year-old boy on whom he had operated immediately after birth for congenital atresia of the anus situated very high

up. He found at that time a cloaca formed by the bladder and rectum. Between the two organs was a wide communication. As the sphincter muscle was incomplete, urine subsequently drained through the anus. The urethra was normally formed and opened into the bladder.

During the war an attempt was made by another surgeon to close the hole in the bladder by a plastic operation. The attempt was unsuccessful and a portion of the urethra in front of the bladder for an extent of about 3 cm. was so far destroyed by secondary infection that subsequently the urethra ended blindly at the perineum.

Nordmann first established an artificial anus on the left side in order to obtain a clean operative field at the anus. From the skin of the perineum he made a substitute for the missing portion of the urethra and thus re-established its continuity to a point close to the opening in the bladder. He then fashioned a large pedunculated flap from the left gluteal region, turned it about, and fixed it over the hole in the bladder. After the operative wound had healed the artificial anus was closed. The boy is now able to retain his stool and the urethral passage is clear but he is obliged to wear a urinal. DENCKS (Z).

Scholl, A. J., Jr.: Histology and Mortality in Cases of Tumor of the Bladder. *Surg., Gynec. & Obst.*, 1922, xxxiv, 189.

Three hundred and thirty-three bladder tumors removed from patients at the Mayo Clinic were reviewed in an effort to determine the mortality of the various histologic types of neoplasm. In 262 of the 333 cases complete postoperative records were obtainable.

Papilloma and epithelioma. Of 168 tumors originating in the bladder mucosa, seventy-one were malignant and three benign papillomata, while ninety-four were either solid epitheliomata or carcinomata; all were removed surgically. Of the three patients with benign papilloma, two are living six years after the operation, and one four years after the operation.

Twenty-six (36.6 per cent) of the patients with malignant papillomata are dead after an average duration of life of eleven and one-half months, while the remaining forty-five (43.3 per cent) have lived an average of two years and three months.

Sixty-seven (71.2 per cent) of the ninety-four patients with solid carcinoma are dead after an average duration of life of seven and one-half months. The other twenty-seven patients (28.8 per cent) who are alive have lived on an average three years and three months.

In either type of malignancy, patients surviving the first year have a fairly good chance of ultimate recovery.

Squamous-cell carcinoma. Of the series of 262 cases, six were cases of squamous-cell carcinoma; three of these were inoperable. The average duration of symptoms was only three months. In one of the three operable cases a recurrence appeared with-

in four months after operation and the patient died eight months later. The second patient died six months after operation. The third is living and well nine years after operation. This is an extremely malignant type of tumor. The onset is insidious and in most cases the growth is not discovered until it has infiltrated the bladder wall extensively.

Adenoma and adenocarcinoma. Five adenocarcinomata were found in the series. One of these patients died two years after operation and one had a recurrence in two years. Of the remaining three, who today are well, two were operated upon six months ago, and one, two years ago. The majority of tumors of this type occur in the upper portions of the bladder. They are slow to metastasize and if a complete resection is done the chance for recovery is good.

Angioma. There were three cases of angioma. One patient, a girl of 7 years, died of hemorrhage from a tumor growing from the bladder to the rectum. The second patient was a man 76 years of age whose growth was inoperable. The third patient, a girl 19 years of age, had a large tumor in the dome of the bladder but is now living and well five years after the removal of the growth. Angiomata have a tendency to bleed readily. In some cases they grow to enormous size, causing distress by pressure on neighboring structures.

Myoma. These tumors were uncommon, only one being seen in the series of cases reviewed. This was found in the case of a man 50 years old who is now living and well eight years after operation. Myomata are frequently mistaken for extravasical growths because they are covered by fairly normal bladder mucosa.

Myxoma. Two specimens of myxoma were noted in the series. One occurred in a child of 2 years who died two months after its removal. The other was found in a child of 16 months and was inoperable; death followed nine days after operation.

Sarcoma. The single sarcoma in the entire series was inoperable and was observed in a woman 39 years of age who died two years after exploratory operation. Cases of sarcoma and myxoma are very poor surgical risks; death occurred in over 50 per cent of the reported cases within six months after operation.

G. H. JACKSON, JR., M.D.

Stellwagen, T. C., Jr.: The Surgical Treatment of Papilloma of the Bladder. *Therap. Gaz.*, 1922, xlv, 77.

Stellwagen opens the bladder in the usual manner and destroys the growth by cutting, snaring, fulgurating, or cooking. He prefers as thorough resection as possible followed by cooking. In cooking the growth, and especially its margins, he uses cauteries made of copper, in reality soldering irons, of sufficient bulk to retain the proper degree of heat for a sufficiently long period. He prefers this method of cauterizing to fulguration or electrocauterization.

The article is summarized as follows:

Most papillomata of large size are either already malignant or undergoing malignant change.

Fulguration is an excellent procedure for a benign growth that can be properly fulgurated.

The actual cautery in the form of a modified copper soldering iron gives better control of the cooking than the electric cautery and does it more thoroughly.

It is well to remove as much of the base of the papilloma and bladder wall as is consistent with good surgery.

J. S. EISENSTAEDT, M.D.

GENITAL ORGANS

Cecil, A. B.: Perineal Prostatectomy: A Detailed Study of 100 Consecutive Cases. *J. Urol.*, 1921, vi, 399.

This statistical study is very comprehensive. Of one hundred and three patients who presented themselves, 100 were operated upon. Two deaths occurred during preliminary treatment. One patient, who was refused operation, died two weeks later. The youngest patient was 52 years of age; the oldest, 90 years and 4 months. Ten were over 80 years. The greatest number were between 65 and 69 years. The average age was 68.7 years. One patient over 90 years of age lived three years following the prostatectomy.

The time of onset of the trouble varied. Nine per cent of the patients had noted nothing unusual until the preceding year. Eleven per cent had had trouble for ten years, and 8 per cent had had trouble for from sixteen to twenty years.

In 65 per cent of the cases the first symptom was frequency; in 43 per cent, difficulty; in 18 per cent, pain; in 3 per cent, incontinence of urine; and in 3 per cent, complete retention.

Residual urine was present in 95 per cent of the cases. In one the amount was 4,750 c.cm. In 9 per cent it was 1,000 c.cm. or more, and in 27 per cent, 500 c.cm. or more. Rectal examination revealed no enlargement in 13 per cent, moderate enlargement in 53 per cent, and decided enlargement in 28 per cent. In 6 per cent the gland was smaller than normal.

In ninety-three cases preliminary treatment was carried out by the retention catheter or by a retention catheter combined with intermittent catheterization. In two cases preliminary treatment consisted of intermittent catheterization alone. Two cases had suprapubic drainage at the time they were first seen; in four cases suprapubic drainage was effected by Cecil; in two cases preliminary drainage was obtained by means of a retention catheter plus suprapubic drainage; and in two cases no preliminary treatment was given. Thirty-two per cent of cases were drained for between two and four weeks. One case had catheter drainage for sixteen months. Fifty per cent of the patients were out of bed during the entire time of the preliminary treatment. Fifty-one per cent developed fever during this time.

Young's operation was performed in every case. The essentials are: (1) the preservation of the

external sphincter; (2) proper exposure of the prostate by taking advantage of the fascia of Denonvillier. After exposure of the prostate an attempt is made to preserve the prostatic urethra by the original lateral incisions of Young through the posterior lobe of the prostate, outlining the ejaculatory bridge and the prostatic urethra, or by throwing back a triangular portion of the prostate, or by means of a single lateral incision, enucleation of the adenoma, and tearing away of part of the prostatic urethra in one mass. To stop oozing Cecil packs the vesicle neck with kephalin gauze. The drainage tube he removes within twenty-four hours.

In 5 per cent of cases the wound closed before the ninth day; in 22 per cent, before the fourteenth day; in 51 per cent, before the nineteenth day; and in 74 per cent, before the twenty-fourth day. In one case closure required one hundred and thirty-three days. In one case permanent incontinence resulted. There were eleven cases of cancer.

The mortality of prostatectomy in this series was 2 per cent.

H. W. E. WALTHER, M.D.

Martin, A. P.: The Verumontanum—A Clinical Study (*El verumontanum—estudio clinico*). *España med.*, 1922, xii, 3.

The author gives a detailed description of the verumontanum from embryological, anatomical, and functional points of view. He considers it the most important portion of the posterior urethra. All infections of the posterior portion of the urethra affect the verumontanum more or less, and in many cases the verumontanum is itself the site of infection, such infection being regarded as a distinct pathologic entity known as "verumontanitis."

The verumontanum is to the seminal vesicles what the tongue is to the upper portion of the digestive tract. Formerly the prostate gland was considered the focus responsible for chronic urethritis, but recently this belief has lost some ground because chronic prostatitis is not quite as frequent as in former years and in the majority of the cases treated by massage a careful endoscopic exploration reveals the lesion in the verumontanum.

In all cases of chronic posterior urethritis the prostatic urethra and especially the verumontanum should be carefully examined. As the verumontanum is richly supplied with nerves, infections of this anatomical structure have a decided effect on the entire nervous system. Great difficulties are encountered in the diagnosis of diseases of the verumontanum because of confusing symptoms which often lead to the belief that the seat of the trouble is in neighboring parts such as the remainder of the posterior urethra, the prostate, and the seminal vesicles. Hence the necessity for careful endoscopic examination.

The verumontanum may give rise to urinary symptoms. The author cites two cases illustrating this fact. In the first, the infection caused such severe pain during micturition and so many symptoms of vesicle irritation that he was led to the

belief that cystitis was present. Cystoscopic examination revealed an inflamed verumontanum which filled all the posterior urethra and bled very easily. The other case was that of a patient of middle age who for four years had suffered with retention of urine following nervous exertion. Endoscopic examination revealed an enormous verumontanum which obstructed the prostatic urethra.

In discussing the treatment the author advises the local application through the endoscope of a solution of silver nitrate. Only in very persistent cases should the solution be stronger than a 10 per cent solution. Tincture of iodine, if used at all, should be diluted and used with care as it causes a strong reaction with hæmaturia, tenesmus, stranguria, and even complete retention.

Recently Martin has obtained such satisfactory results with fulguration that he believes this method will eventually supersede all others.

P. R. CASELLAS, M.D.

Corbus, B. C., and O'Connor, V. J.: The Familial Occurrence of Undescended Testes; Report of Six Brothers with Testicular Anomalies. *Surg., Gynec. & Obst.*, 1922, xxxiv, 237.

Corbus and O'Connor report briefly the history and physical condition of a Russian man and wife and their family of six boys and two girls. Both parents were physically normal. Each one of the six boys has some defect in the development of the external sexual organs varying from an unilateral undescended testis to bilateral undescended testes, one of which is intra-abdominal. In every instance one or both testes is undescended.

One of the girls is apparently normal while the other, who is 15 years old, has never menstruated and has distinctly masculine characteristics.

The hereditary tendency in cryptorchidism both in human beings and in domestic animals has long been recognized. Heredity and peritoneal adhesions are mentioned as the only accepted etiological factors.

HARRY CULVER, M.D.

Mollá, V. M.: Perineal Section (La talla perineal). *Med. Ibero*, 1921, xv, 439.

Mollá states that perineal section has been practiced since ancient times in diseases with calculus formation. It was described by Hippocrates. From Hippocrates until the time of Celsus no improvement was made in the technique. Celsus performed transverse perineal section.

Amonius of Alexandria practiced perineal trituration of large calculi. Two centuries later than Celsus, Antyllus recommended that the incision be made above the neck of the bladder rather than over its body. Aetius invented a special bistoury for the sectioning of the deep tissues in the transverse perineal section of Celsus. This was the precursor of the lithotome of Fray Cosme. Paul of Aegina made a lateral oblique incision in the perineum.

These modifications were the forerunners of all present-day methods of perineal section. They persisted to the fifteenth century when Guy de Chauliac abandoned them and turned back to the original transverse section of Celsus. The hypogastric section was used most frequently in the seventeenth century but in the eighteenth century was superseded by the perineal section, especially in France and Spain.

W. A. BRENNAN.

SURGERY OF THE EYE AND EAR

EYE

King, J. J.: Total Blindness of Both Eyes Cured by Drainage of Sphenoid and Ethmoid Cells. *J. Am. M. Ass.*, 1922, lxxviii, 508.

King reports the case of a woman, aged 50 years, who had symptoms referable to sphenoid and ethmoid disease over a period of four months. A decrease in visual acuity in the right eye for four days terminated in total blindness at the end of the fourth day.

Kelly, to whom the patient was referred, reported that the pupil of the right eye was moderately dilated and immobile and showed no consensual reaction. Vision was nil, even perception of light being absent. The fundus was normal.

In the roentgenograms of the sinuses made by Dixon the right ethmoids and both antrums were cloudy, but the left ethmoids were fairly clear. In lateral plates the ethmoids and sphenoidal regions were cloudy.

On the evening of the day of observation King did a simple exenteration of the anterior and posterior ethmoids and removed the anterior inferior wall of the sphenoid. Three days later Hunt reported negative neurological findings, but a Wassermann test was four plus positive.

Five days after the operation vision had improved, the patient being able to count fingers at $2\frac{1}{2}$ ft. Seven days after the operation treatment for syphilis was instituted. At the end of two weeks vision was improved to 20/40.

Eleven days after the operation on the right eye the patient complained of decreasing visual acuity in the left eye. Sight completely failed in a few days, regardless of specific treatment for a period of two weeks. Following an operation on the left sinus, vision promptly cleared to 20/40.

On the basis of this case King concludes that in sinus disease affecting vision operation must be performed early if sight is to be restored.

JAMES P. FITZGERALD, M.D.

White, L. E.: Aeration of the Posterior Accessory Sinuses in Acute Optic Neuritis. *Boston M. & S. J.*, 1922, clxxxvi, 172.

After a careful study of accessory sinuses and numerous cases with interesting findings White draws the following conclusions:

The optic nerve is in close relationship only to the sphenoidal sinus and the posterior ethmoidal cell. In order to reach the tissue adjacent to it the direct and logical route is through these structures and not through the entire ethmoidal labyrinth.

The diagnosis of acute optic neuritis can sometimes be made from the symptoms alone, while at

other times it can be determined only after the most careful and painstaking study. Roentgenograms are usually disappointing. Great care is necessary to exclude brain tumors.

No one etiological condition is responsible for all cases. Purulent infections may account for a few but there are many in which the infection is non-suppurative. Poor ventilation and faulty drainage are all-important predisposing factors. The size and position of the middle and superior turbinates are of great importance in aeration of the posterior sinuses.

White enumerates the causes of the pathology as follows:

1. The direct extension of acute and subacute infections spreading to the optic nerve by continuity of structure.

2. Toxæmia. The optic nerve may be involved by toxins originating in the accessory sinuses.

3. Bacteræmia. Micro-organisms may be carried from the sinuses to the optic nerve by way of the blood stream or lymph channels.

4. Hyperplasia. This is a predisposing factor of considerable importance as it tends to render the accessory sinuses more vulnerable.

5. Anaphylaxis. There seems to be a similarity between optic neuritis and certain anaphylactic reactions comparable to asthma and hay fever. As sinus infections cause asthma, it is conceivable that they might also produce engorgement about the optic nerve.

The prognosis depends on the duration and extent of the loss of vision, the condition of the fundus, and the virulence of the infection.

In acute swelling of the middle or superior turbinate, treatment to cause the subsidence of the swelling is indicated. In cases of chronic enlargement turbinectomy is necessary.

Acute inflammation is frequently followed by spontaneous recovery.

In chronic thickening of the turbinates there is probably some change in the lining of the accessory sinuses. In such cases, following the removal of the middle turbinate, White removes the front wall of the sphenoid and uncaps the posterior ethmoid wall to obtain aeration.

If the removal of all foci of infection, such as teeth, tonsils, etc., is followed by proper aeration a complete ethmoid exenteration is unnecessary.

JAMES P. FITZGERALD, M.D.

Marx, E.: Eye Symptoms Due to Osteomyelitis of the Superior Maxilla in Infants. *Brit. J. Ophth.*, 1922, vi, 25.

The author tabulates thirty-five cases found in a careful search of the literature and describes cer-

tain serious and probably frequent errors that are made in the diagnosis and treatment.

The eye signs found were: swelling of the lower eyelid, conjunctivitis, exophthalmos, fistula in the region of the lachrymal sac or the lower eyelid, abscess of the lower eyelid, and swelling of the vessels of the retina. Marx states that it is easy to confuse a purulent dacryocystitis with fistula formation with an osteomyelitis of the superior maxilla and it is essential that the examiner be careful in inspecting the canaliculi.

Of the thirty-five cases tabulated eighteen were cured. Ten of the patients died and the results in seven cases are not known. The author theorizes interestingly as to the causes of the osteomyelitis but states that too little work has been done to warrant any general conclusions. T. D. ALLEN, M.D.

Lopez, C. J., Ribon, V., and Chavarria, A. P.: Melanotic Epithelioma of the Conjunctiva (Epithelioma melanico de la conjuntiva). *Siglo méd.*, 1922, lxi, 174.

A man of 38 years who was operated upon by the authors had a small, deeply pigmented tumor in the internal angle of the right eye which had been noticed for the first time about eight months previously. The tissues surrounding the tumor were very vascular and there was intense conjunctival irritation. The tumor was diagnosed by Lopez as a melanotic conjunctival epithelioma.

The tumor was completely resected under cocaine-adrenalin anæsthesia in a manner similar to the removal of a pterygium. The patient left the hospital apparently cured but ultimately a recurrence will probably develop necessitating the removal of the eye. Histologic examination of the removed tumor confirmed the pre-operative diagnosis of melano-epithelioma. W. A. BRENNAN.

Møller, P.: Metastasizing Sarcoma Following Foreign Body in the Conjunctiva (Metastasierendes Sarkom nach Fremdkörper der Conjunctiva). *Ugesk. f. Læger*, 1921, lxxxiii, 1239.

A 47-year-old man had a splinter of wood lodge in the left conjunctival sac. Between two and three months later he noticed irritation with secretion and pain. A papillomatous tumor was found, which contained a fragment of the splinter.

There were three recurrences following excision. Metastases then formed rapidly in the glands in front of the ear and then in those of the neck and axilla and around the umbilicus. Soon there was general subcutaneous extension, even to the neck of the left femur. Death occurred at the end of three and a half years. The metastases in the glands yielded to X-ray treatment, but those in other parts of the body progressed.

Microscopically the tumor was a large round-celled sarcoma. Sarcomata of the conjunctiva are rare. According to Graefe and Saemisch, they have been observed occasionally following injury.

DRAUDT (Z).

Herbert, H.: The After-Treatment of Small-Flap Sclerotomy. *Brit. J. Ophthalm.*, 1922, vi, 65.

Herbert states that his failures in small-flap sclerotomy were due to beginning massage too late. He now believes the application of gentle, sustained finger pressure through the lower lid may be begun on the afternoon or the evening of the day of operation and repeated two or three times daily, the anterior chamber being partly emptied.

After the first few hours the patient should be encouraged to keep his eyes open and to blink frequently. A pad over the eye operated upon may be necessary for the first night or two but during the day only a shield should be worn.

The author retracts his recent suggestion to restrict the small-flap operation to cases of plus tension that can be reduced by eserine.

He believes that surgeons are too easily satisfied with trephining, and cites cases in which the elevated remains of conjunctiva over the dark scleral opening became progressively thinner.

In conclusion he points out the recently limited return to the small-flap sclerotomy, and expresses the hope that with the help of the after-treatment suggested the movement may be widely revived, not that this operation is the ultimate solution of the glaucoma problem but because it is a partial settlement which is practical until a technical detail is discovered that will make "ideal sclerotomy" acceptable.

In advanced cases of glaucoma in which the sclerocorneal wound heals more or less firmly other treatment is necessary. JAMES P. FITZGERALD, M.D.

Smith, H.: Glaucoma (Simple—Chronic). *Practitioner*, 1922, cviii, 131.

Until more is known of the chemical physiology of the eye there seems to be little hope of determining the primary causes of glaucoma as distinguished from the final causes. The theories so far advanced are practically all based on end causes. The most plausible is Fischer's theory that glaucoma is an œdema of the vitreous caused by acidosis. If by "acidosis" is meant an abnormal "substance" circulating in the blood which has a special affinity for the vitreous in which it causes an œdema, or if it is the absence of some normal substance without which the vitreous tends to become œdematous, this theory seems very plausible as it is known that myxedema is caused by the absence of a normal substance, while in albuminuria the abnormal substance tends to cause an œdema of the cellular tissue of the larynx.

Before Létrange, the operative treatment of glaucoma was limited to iridectomy because this operation strips the iris from its attachment at the base and exposes the filtration area. Létrange began the complete excision of a small section of the sclerotic coat just behind the attachment of the conjunctiva to the sclerocornea (trephination), his object being to form a subconjunctival drain which would function for some time.

Unfavorable results from trephination have been reported. The author, however, has employed it extensively with success and regards it as a less difficult operation than iridectomy through a scleral wound. A 3-mm. trephine is used, and an iridectomy is always done through the trephine wound. In cases of acute glaucoma in which the sudden swelling of the lens in the development of cataract presses the iris forward against the cornea and the lens itself comes up against the cornea, trephination is practically impossible.

If subconjunctival injections have been given for other conditions the conjunctiva must be reflected with the subconjunctival tissue (which is no longer loose) so as to give sufficient covering for the trephine opening. The conjunctiva alone does not give sufficient covering. If a straight incision is made, the conjunctiva and subconjunctival tissue are easily kept out of the way during the operation, and when released, tend to stay in position.

The clockwork trephine is unsatisfactory as its speed cannot be regulated and it has a tendency to

become rolled up in the loose subconjunctival tissue. Elliot's trephine is so thin that it has a tendency to plunge, and because it is a one-handed instrument its control is not as delicate as if the energy were distributed between the two hands. Gradle's trephine is admirable as it is thick and tapered in the cutting end and therefore does not tend to plunge.

At present, trephination is done to form a permanent drain into the subconjunctival tissues. The author thinks this is not satisfactory because if the eye is to remain normal there must be normal tension and therefore the establishment of a permanent drain to perform a physiological function is unsound: if the drain is too large the tension is subnormal, and if it is too small, the tension is above normal. An iridectomy properly done effects drainage for a limited time which, if long enough, permits the re-establishment of the physiological equilibrium of the eye; trephination results in similar drainage of somewhat longer duration. Neither drain remains permanent.

C. CORBIN YANCEY, M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Iglauer, S.: A Review of Recent Progress in Rhinoplasty. *Med. Times*, 1922, 1, 52.

Iglauer reviews the progress made during the past few years in the operations for the correction of nasal deformity. This advance has been due in a large measure to the impetus given plastic surgery by the World War. In civil practice corrective rhinoplasty has advanced rapidly since the more general recognition of the fact that this type of operation constitutes a legitimate field of surgical endeavor.

For the replacement of large nasal defects Gillies has devised an ingenious operation employing a skin flap with a tubed pedicle taken from an adjacent region such as the temporo-frontal area. The tubed pedicle is formed by parallel incisions leaving an attachment at each end. The skin is undermined and raised and the free borders of the pedicle are sewed together. After three weeks the flap attached to one end of the pedicle is raised and sewed into position in the nose, the pedicle being left in its tubular form. Subsequently the excess tubular tissue is severed from the nose, unfolded, and replaced in the temporal region from which it was taken. When it is necessary to implant bone as well as skin, a piece of cartilage or bone is implanted subcutaneously and included in the tube when the latter is constructed.

Blair says that the two most important advances in rhinoplasty during the war were the recognition of the fact that the lining is as essential as the external covering and that the reconstructed parts should be cut from carefully made patterns.

For the correction of saddle nose deformity the implantation of autogenous chondral cartilage has become the method of choice. Experimental and clinical observations show that when bone is transplanted into soft tissues it will gradually degenerate and disappear but that if the transplant is placed in contact with the cut surface of normal bone it will continue to live, especially if it is subjected to the stress of function. It then not only survives but is capable of regeneration.

Carter states that in his experience rib implants in saddle-nose deformity have survived for years. This is contrary to the view held by many surgeons.

When cartilage is employed it should be taken from the right costal synchondrosis and the perichondrium should be left on one side of the implant. If bone implants are used, the removal of bone from the tibia renders the patient very lame and liable to spontaneous fracture of the tibia. Such a fracture occurred in Iglauer's experience several weeks after operation. Tieck, who uses the middle or lower

turbinate bone as the source of his implants, reports excellent results. The spine of the scapula seems also to be an excellent and easily accessible region from which to obtain bone grafts for nasal plastics.

The transplant is usually introduced through an incision made within the vestibule of the nose. Dufourmentel describes a new invisible incision in the eyebrow. Through this incision the soft tissues over the nose are elevated down to the tip and a cartilage implant is worked down into place.

Under modern antisyphilis treatment transplantation operations to correct the saddle nose due to lues seem to be more successful than in former years. Carter presented such a case in which he obtained an excellent result, and Iglauer reported one in which seven salvarsan injections were given prior to operation and the transplant still remains intact after fourteen months.

For the grossly oversized nose (rhinomegaly), Cohen describes a modification of the usual procedure. After elevation of the soft tissues through vertical subcutaneous incisions within the vestibules, all irregularities are removed with a rasp. With saw cuts, first on one side and then on the other, the nasal bones are severed at their attachment to the nasal processes of the superior maxillæ and from the bony septum so that the prominent lower ends of the nasal bones can be depressed. The tip is then shortened and elevated in the usual manner.

As a mechanical aid in nasal surgery Whitman has devised a nasal splint to hold old fractures of the nose in place after their reduction. This splint is cemented to the upper teeth and through a vertical arm makes pressure against one side of the nose. Berne has devised an excellent concave rasp for the removal of the nasal hump. As an aid to the rhinoplastic surgeon Iglauer has recently remodeled Pyncheon's motor-driven handle. Suitable rasps and saws have been fitted to it, which materially shorten the time and labor of the operation.

MARGARET I. MALONEY.

THROAT

Coakley, C. G., and Pratt, E. L.: Analysis of the Systemic and Local Conditions Following Tonsillectomy and Adenoidectomy. *Laryngoscope*, 1922, xxxii, 81.

The authors' analysis is based on 926 cases operated upon for tonsils and adenoids during the period from January 1, 1908, to July 1, 1920. Questionnaires were sent to each patient asking for certain information and requesting re-examination if the results were not satisfactory.

The ages of the patients varied from 6 months to 68 years. Seven hundred and ninety-four (86 per

cent) were given a general anæsthetic and 132 (14 per cent) were operated upon under local anæsthesia.

The operative technique was the same whether the tonsillectomy was done under general or local anæsthesia. Suction was employed at all stages. The tonsil was seized with forceps, the anterior and posterior pillars were freed from the capsule, and the dissection was completed by the use of the cold wire snare. A rounded gauze sponge on a holder was inserted into each fossa and left for two or three minutes. Following its removal all bleeding vessels were ligated. The fossæ and enucleated tonsils were inspected to see that no tonsil tissue was left.

The amount of hæmorrhage in children under 6 years of age was about 1 dr. per tonsil and in adults 6 dr. per tonsil. Hæmorrhage was usually least when local anæsthesia was employed.

In adenoidectomy it was found impossible to remove all traces of lymphoid tissue. The LaForce adenotome and Goldstein's curette were used; also the punch forceps to excise the lymphoid tissue below the eustachian tube on the lateral wall of the pharynx. The amount of blood lost was usually more than that from the two tonsils combined.

Hæmorrhage was the complication most to be feared. There are two types of hæmorrhage—that occurring within twelve hours, and that occurring several days later. The blood usually flowed from beneath a clot which filled the fossa. The treatment consisted in the removal of the clot and the application of a clamp and ligature.

Hæmorrhages occurring late in the course of healing were due to dislodgment of the exudate in the fossa. The clot was removed and the bleeding points ligated if necessary.

Fifteen patients had hæmorrhages. The youngest was 13 years of age and the oldest 45 years. Nine patients bled within twelve hours after the operation. Of the other six, three began to bleed on the fifth day and three on the sixth day.

Two patients had hæmorrhage from adenoids. One of them developed acute otitis media.

Six patients have died since the operation. All deaths occurred several years later. Two were due to endocarditis, one to diabetes, one to meningitis, and one to injury. The cause of one death is unknown.

Of the 926 patients only 689 replied to the questionnaire.

Of the nine patients with sore throats who reported no benefit from the operation tonsillar tissue was found on re-examination in only one. Of the eight others, one had sinus disease; one, a deviated septum with dry pharyngitis; and five, hypertrophy of the lymphoid tissue on the lateral and posterior pharyngeal walls.

One patient who complained of quinsy following operation had a small piece of tonsil in the right fossa.

Four patients with enlarged cervical glands stated that the glands were greatly reduced in size, and four reported no benefit.

There were forty-two cases in which ear trouble was given as the primary cause for the removal of tonsils and adenoids.

Thirty-five patients sought relief for mouth breathing. Seven were operated upon for adenoids and twenty-eight for tonsils and adenoids. In the thirty-five cases, the operation was reported unsuccessful in two and only partially successful in two. In one of the cases in which it was unsuccessful there was sinus disease, and in one a recurrence of adenoids.

Twenty per cent of the patients gave some systemic condition as the chief cause for operation. Fifty-five conditions were mentioned.

Of the five heart cases, the results were reported as entirely successful in three and as only partially successful in two.

Five patients with kidney lesions had acute nephritis. All were benefited, the symptoms having disappeared.

Of five asthma cases, the operation was successful in one, only partially successful in two, and unsuccessful in three.

Two diabetic patients were operated upon without benefit. Fifteen patients with a run-down general condition were completely relieved.

Secondary operations were done on 145 patients. One hundred and fifteen of these had had one previous operation, twenty-three had had two, and seven had had more than two operations.

One hundred and seven patients had had rheumatism previous to operation. Ten reported that they were cured, seventy-five stated that they were better, and twenty-two were unimproved. Of the forty-six patients who gave rheumatism as the primary cause for operation, only eight reported no benefit. These eight patients were examined and found to have no remaining tonsil tissue.

Frequent colds in the head were reported by 472 patients. In 346 cases the operation was entirely successful, in thirty-two partially successful, and in ninety-two not successful.

One hundred and eight patients had had frequent attacks of earache before operation. Eighty were entirely relieved, seven partially relieved, and twenty-one not benefited.

Fifty-three patients had had frequent attacks of otitis media before operation. Thirty-seven reported an entirely successful result, five a partially successful result, and eleven no benefit.

Sixty-six patients had earaches or acute otitis media after the removal of tonsils and adenoids. Seventy-seven per cent of these were children between the ages of 1 and 10 years.

Sixty-two patients reported that there was tonsil tissue remaining after the operation, but only fifteen were re-examined. Three of the latter were found to have tonsil tissue.

A summary of the replies shows that the operation was satisfactory in 529 cases, without benefit in eighteen, and unsatisfactory in thirty-four. In 30 cases the operative indications were not relieved.

Seventy-eight patients did not answer the questionnaire. The authors draw the following conclusions:

1. When the pathologic condition of the tonsil warrants its removal, age is as negligible a factor as it is in the consideration of any other common surgical operation.

2. Hæmorrhage, either during or after operation, can and should be controlled according to the same surgical principles which govern its control elsewhere in the body during a surgical operation.

3. A well-performed tonsillectomy and adenoidotomy causes a marked lessening of the acute infections of the upper respiratory tract and lessens the tendency toward attacks of acute middle-ear infection.

4. The percentage of successful and partially successful results in cases of rheumatism justifies the removal of tonsils in cases in which the tonsils are proved to be diseased and the elimination of other foci of infection has failed to relieve the condition.

5. Cardiac and renal conditions associated with infection of the tonsils should be studied with care before tonsillectomy is advised lest serious results ensue. In properly selected cases the percentage of successful results justifies the operation.

6. When the operation is well done for the relief of a definite pathologic condition the percentage of successful results is most gratifying.

FRENCH K. HANSEL, M.D.

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NOTE.—The bold face figures in brackets at the right of a reference indicate the page of this issue on which an abstract of the article referred to may be found.

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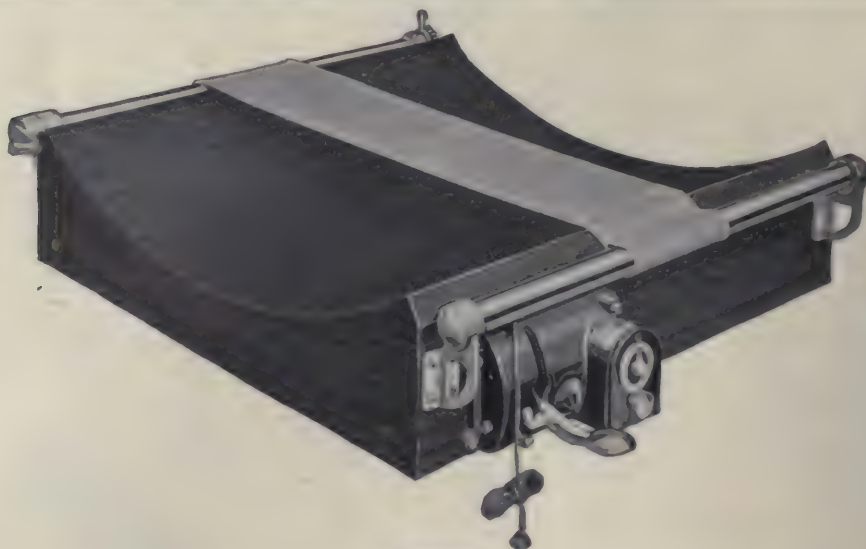
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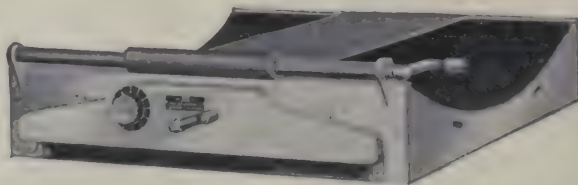


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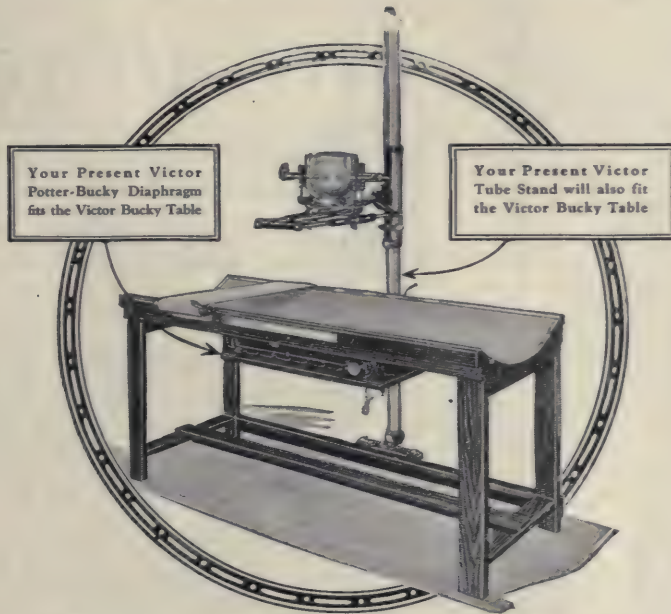
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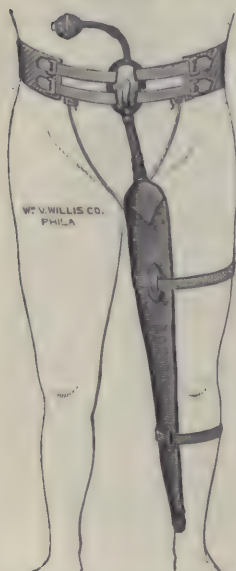
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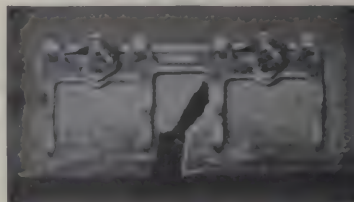
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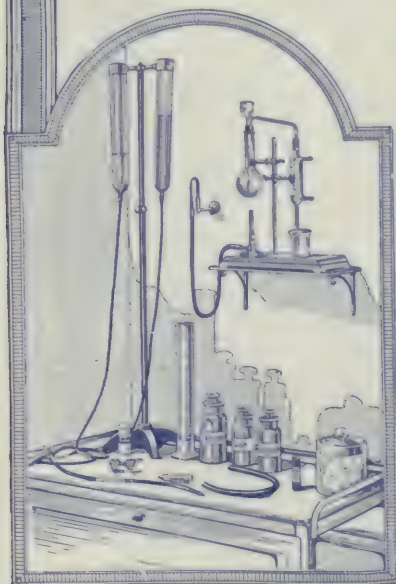
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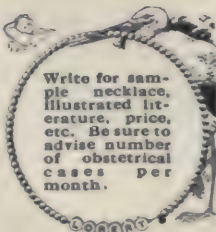
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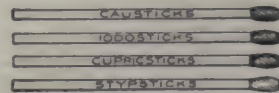
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11-12	Hygiene and Preventive Pediatrics	Anaphylactic Clinic	Physio-Therapy	Bedside Therapeutics	Contagious Diseases	Malnutrition Clinic
12-1	Clinical Lecture	Clinical Lecture	Clinical Lecture	Clinical Lecture		Conference and Quiz
2-3	Practical Pediatrics	Diagnosis and Treatment	Practical Pediatrics	Diagnosis and Treatment	Practical Pediatrics	Diagnosis and Treatment
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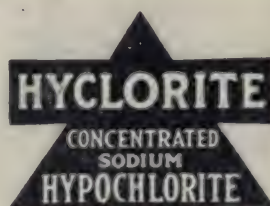
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